



Lucy
Fitch
Perkins



HOME SPHERE *of* CHILD LIFE

The New World of Child Play

The Old World of Child Story

A PLAN TO PROMOTE THE CULTURE OF WORK AND PLAY AMONG CHILDREN IN THE HOME.

EQUIPMENT AND LITERATURE.

CHAUTAUQUA INDUSTRIAL ART DESK.

CHILD LIFE. THE HOME TEACHER

CHILD LIFE

PART ONE—Child Activities in Art and Industry

PART TWO—Stories of Great Industries

THE STORY OF KING COTTON

From the tropical fields of India,
Egypt and our Southern States

THE STORY OF PRINCE WOOL

From the dreary wastes of Australia, Arabia and our Western States

THE STORY OF QUEEN SILK

From the sunny climes of
Italy, China and Japan

**Through the mills and factories of our Eastern States to their uses
in supplying Human Need and Want**

POWERS, MYERS AND COMPANY
Chautauqua Park, Valparaiso, Indiana

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ACKNOWLEDGMENT

It is a pleasure to acknowledge the courtesy and hearty co-operation extended to us in the preparation of these stories.

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FOREWORD

THE aim and scope of this idea—THE HOME SPHERE OF CHILD LIFE—are beautifully interpreted by the cover pictures of the two books, the "Home Teacher" and "Child Activities," which complement our self-instructing equipment.

These pictures "Father Time and the Child," and "Her Son," may well be studied side by side. The former projects the bequest that the PAST has prepared for the child. Father Time bequeathes to the Child, the World—its noble deeds, the struggles of its races of men, the light and the progress gained since the break of the earliest day. This bequest is unlike money or titles to lands. It cannot be spent or squandered. It is a prize earned and cherished in honor as the mind grows into conquest of it. The fitness of representing this gift to the child, as being rendered in the name of a father, deserves remark, for it is the function of fatherhood to lead the child into his first world-experience and by the honor and useful service of his own work to bring to the home such protection, comfort and rewards as the highest type of family life requires.

"Father Time and the Child" fixes the period at which the father's fullest duty and influence begin, something like "Her Son" suggests the fullness and, as it were, the completion of the mother's most beneficent service. For the part of a mother is a tragical one. As the boy-child enters young manhood—a little less so with the girl-child entering young womanhood—her service consists in making herself useless to the life which, in infinite patience and tenderest thought-through love, she has tried to shape and inspire with splendid incentive and high purpose to achieve.

"Her Son" depicts the mother's anxiety when the boy begins to assert the choices and responsibilities of an awakening reason, to gain control of the powers of a completely functioned body and to respond to and interpret the demands and forces that nature and society set to play on the individual.

The next great step in race culture may be in the direction of society determining who and what kind of child shall be born, for of all the social problems now being studied, whether commercial, educational, political or religious, our findings carry us back to a **solution in the welfare and fitness of the individual child**.

The recent progress of scientific thought permits the affirmation of a few general propositions. First, an **equal parental responsibility**, for the character and soundness of the child begins in the uprightness and nobility of the full span of the father's and mother's lives. Second, there is in each child the potentiality to be at least anything and all those who gave him life were and are. Third, the consciousness of the infant may be conceived of as a clean sheet of paper upon which the parent begins to write. Of course paper may vary greatly in size but be it remembered that even the smallest sheet may take the finest truth that sparkles in the blue skies of literature. Fourth, there is a child's world, totally different and distinct from that of the "grown-ups." It is largely in the **discovery of this child-world** and in the exploration of the mind and sphere of life of its little inhabitants that the mother is to find her joys and rewards in life. It is a strange world, this child-world, for we grow up out of it and are hardly more able to return to it in thought and feeling than we are in physical being and stature.

How strange that it is really impossible to make intelligible the idea of what we all are or were—what it is to be a child. No mother can explain her own child's love for her doll. As a boy the father made a horse of a broomstick. He remembers something of the fact but is unable to tell what prompted him to do so.

These simple observations enable us to understand the frightful violence so generally but unintentionally worked upon children. It is especially so in the Home, for our **modern homes are designed and furnished almost solely for the comfort and convenience of the grown members**. The home environment is accordingly too unnatural to the child. Nothing fits.

Everything is too big, too clumsy, too heavy. He is baffled at every turn. This forcing of the child into the impossible-to-know world of the grown-up is a broad ax which mercilessly cuts in two, yea, into fourth and hundredth and thousandth parts the potentialities of almost every life.

The industrial revolution has robbed the child of easy, helpful duties in the home by which he ministered directly to the father and mother, the brothers, sisters, kin, friends and servants—all who happened to be of the family circle. The work which was formerly the **most effective means of discipline** in the young life is now done in factories and for good cause, the law prohibits the child doing any of the work which, a while ago, he played at in the home. The child helped to break the flax, to card the wool and he generally made the candles. Now when we want light in the home, instead of the child being taught to make a candle by his parents, a button pressed gives a flood of light and there is practically nothing left to be understood or done by the child. Indeed, few boys are fortunate enough nowadays even to have wood to carry. The remnant of economic service to be performed at home is chiefly in the girls' sphere. This fact is the wedge by which the girl has forced her way into our industrial and professional life. **It is fashioning the new woman—the woman of self-dependence and self-reliance.**

The difficulty of the home problem has been further emphasized by a thousand other attractions that have arisen outside the home to take children away from the control and care of parents. This is the effect of most modern inventions, except the phonograph. The function of the equipment and literature in this plan is to afford **helpful work and play for the children in the home.** The great variety of uses to which the child puts the equipment gives the necessary spice to child activities and is a powerful stimulus to originality and inventive talent. Each picture study contains the **elements that lie at the basis of a useful pursuit or occupation.** They aim to help the child to find out what is best for him to do in life. The printed word is introduced only as a means of interesting the child in other books and to have him understand what books are for. **Habits of mental industry are thereby encouraged simultaneously with physical industry.** The extent of its free-will use, caused by its magnetic attraction to the child, helps to emphasize the important truth that regardless of what may detract from it, the home must ever remain the greatest of all schools.

When the trades and industries abandoned the home to occupy factories, and public sentiment began to grow against the wisdom of the child following industries into the factory, a great impulse was given to the growth of public schools. When the father left the home because of the change of his place of work from about the home to the shop, he **turned the education of the children over to the mother and she passed the duty over to the public schools.** Mediaeval ideals of education dominated the schoolroom with the consequence that the farther a subject was removed from the possibility of making the child a serviceable and efficient citizen, the more highly it was prized as a "cultural" study. The present persistent demand for vocational education for every child is an effort to get the public school **back to the point at which it should have begun** the realization of its magnificent opportunity. As the school becomes radically vocational, many of our most alarming social problems will begin to disappear. It will then become as clearly the duty and function of our educational institution **to help each boy or girl to find the thing which is best for him or her to do in life** as it is now for the parent to provide clothing for the child.

Just to the extent that the school has to do with preparing the child for a definite life-work, there will spring up a **close unity and sympathy between the home and the school** of a kind as intimate and more effective than in the period when the home and school were practically one; for the reason that, with the interests of the home and the interests of the school being that of the life work of the child and the improvement of child-life itself, the parent and teacher will have a common purpose and mutually inter-dependent duties to perform. The teacher will then assume her rightful place as a public servant. But with full appreciation for the fine work she will ever do, the basic fact remains that the teacher's relation to the child is one of "quid pro quo"—this in return for that. Whereas, the comforts and finer inspirations in the parent's life are in the ultimate success, the distinction of character and the worthy achievements of the child grown into manhood or womanhood. And be it said, to their undying honor, and in the hope of stirring more to like emulation, a large part of the old in years gain their comfort, reward and satisfaction in life from the **interest accruing on the investment they have made in the American boy and the American girl.**

Part One

Child Activities in Art and Industry

Prepared for

The Home Sphere of Child Life

By

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Supervisor of Juvenile Department of Art Institute, Chicago.

Chapter I.

Materials.

JANUARY.

Paper for Cutting—Light and dark paper, scissors and paste.

Drawing—Blackboard and talc pencils, manila paper and pencil, colored crayons and charcoal.

Painting—Manila paper, three color box of water color paints, large brush, cloth and glass.

Modeling—Clay and board.

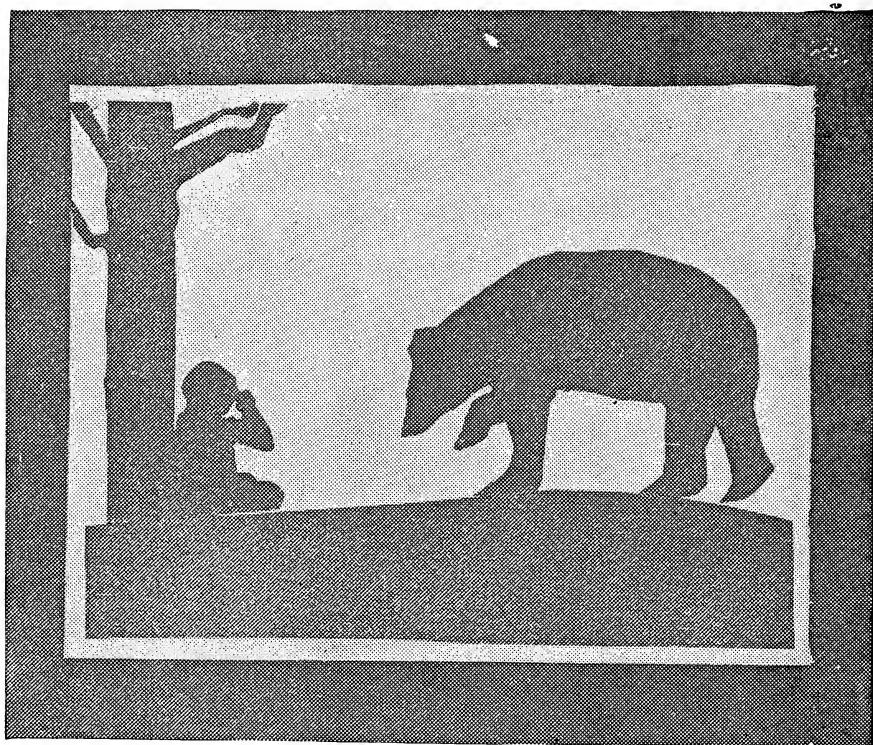
A Story to Illustrate

Did you ever hear the story, "How the Bear Saved the Life of the Little Red Baby?" I'll tell you all I can remember of it.

The little Indian boy strayed away from the wigwam and got lost. He was very happy till it grew dark; then he thought of his mother and began to cry. An old mother bear was near, and heard the crying, and thought it was a little lost baby bear. She found him and picked him up in her big, furry arms. He then stopped crying and fell asleep. He slept all night with the little bears. In the morning the mother taught him to come after her and find beech-nuts. She had a hard time to get him to follow her, standing up on her hind legs and walking out many times. At first the little boy just laughed at the funny sight, but at last he understood and followed. He liked the nuts, and the mother

bear was very gentle to this funny little bear. So, many strange, happy days passed until his parents found him. He grew up to be a great warrior and hunter, but he would never hunt bear.

Perhaps you know this story and could have told it better than I, but what I want you to



For the Paper Cutters

do is to tell it in paper cutting. Are your materials ready? Lay down a piece of the white paper, take up a piece of the dark and out of it cut many pictures. When you have cut one that you like, paste it on the light paper. Cut a picture of the wigwam and the little boy starting down the path; another where the bear finds him; then one of the bear on her hind legs. You will probably have to cut a great many pictures before you make a good one. Try drawing them on the blackboard also. Take the broad side of your talc pencil and draw many little bears and a large one walking.

Are there children who have some nice, soft clay to use? If so, take a lump of this and model out of it the mother bear and her babies. The young bears have larger heads for the size of their bodies than the older ones. Have all the fun you can with it. Try the wigwam and the boy. Perhaps there might be some rabbits in the woods; try them.

Be fair with yourselves. Ask the criticism of your parents and friends, and try to make each effort better than the one before. Spend much of your time on object drawing, but try also to illustrate the above story in charcoal, pencil or color.

Design for a Valentine

When Valentine's Day is near, you will, of course, want to make at least one valentine. Cut out a lot of little hearts exactly alike for "units," and arrange them in many different

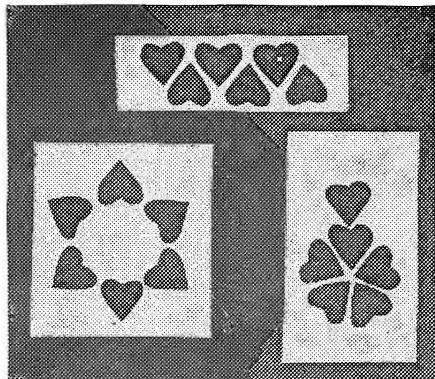
ways to make a design, possibly a border all around the edge or across the top. Print neatly "To My Valentine," or, "I love You," in paint to match the hearts. Make a double large one the shape of a heart and do your printing inside. Be careful that the letters are even and plain, as many good designs are spoiled by printing that is careless or too fancy.

Object Drawing

Do not make a habit of copying these drawings often; they are only suggestions. Take a block or a top from among your playthings; study the shape carefully and see in how many positions you can draw it. Then cover it and try to draw it from memory. Cut the shapes of your toys out of paper and model them in clay. "Practice makes perfect," you know.

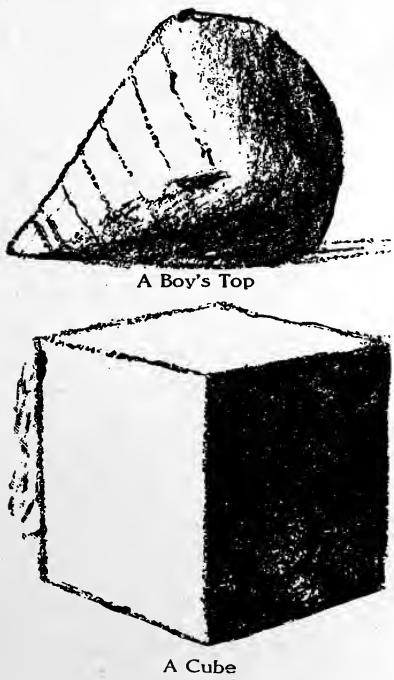
For the Older Children

Practice every day at least fifteen minutes if you would like to learn to draw. Use the blackboard freely. Do not limit yourselves to copying the pictures in your chart, as this gives you only one position. Find the article itself and draw it in other positions also. Then try to draw it from memory. This is such good exercise and helps to make you more observant. Remember this, the more you draw the faster your eye will become trained to see and the hand trained to draw what you see.



For St. Valentine's Day

Are you having a good time with your Christmas toys? What a lot of things you could tell about them! Perhaps some are already broken and had to be put away. Have you grown tired of playing with them? If so, let us suggest a new way to enjoy your playthings and to learn something at the same time.



A Boy's Top

A Cube

Cutting

Take a large sheet of paper and cut pictures of your toys. The engine on the next page was cut by a little boy of eleven years, and the sled, coffee and teapot by a little girl of nine. It will be great fun to see how well you can cut out some of your Christmas presents. You have played with them some days, so you surely know how they look. Do not be satisfied with one cutting. Make many, each time improving on the one before.

If you have dark paper to cut, paste them on a sheet of light paper, or if you make your cuttings of light paper, paste them on dark; they show off so nicely and you can readily see where they are wrong.

Drawing

You will, of course, want to draw your playthings, too.

Invite a few playmates, or your sisters and brothers, and see who can draw the best.

Draw on your blackboard first for practice, then all take paper and when you have finished, pin them

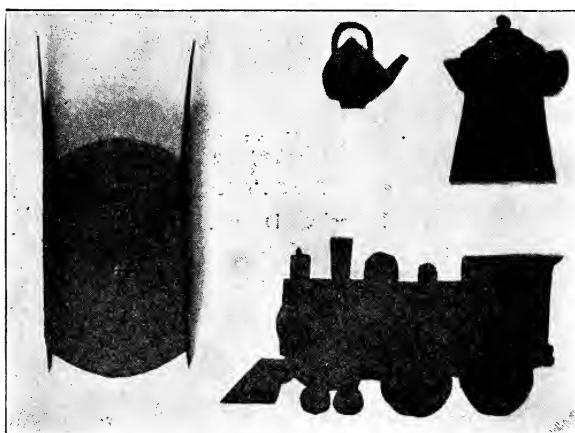
HOME SPHERE OF CHILD LIFE

all up and ask your parents or older sisters and brothers to decide which are best. You will really enjoy it and the practice is splendid for you. When you are able to cut and to draw these objects well, you will be able to use them in your design lesson.

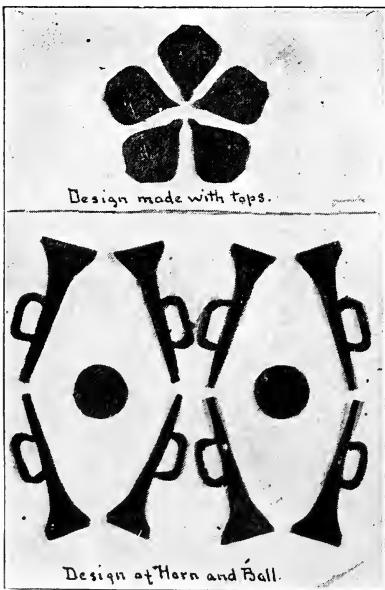
Construction

Make toys out of cardboard, any color will do. You can use old boxes, and if you want them to be a certain color, paint them with your water colors. You have no water colors? A box may be obtained for a few cents at a stationery store.

The sled is very easy to make. Try some things that are harder—a rocking-horse, an engine, a car, an automobile, etc. You will think of many things more than we can.



For the Paper Cutters



Design

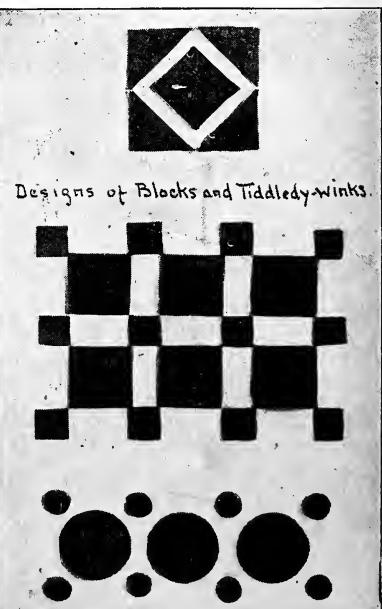
“Design-play” with toys such as blocks, tiddley-winks, tops, tooth picks, dominoes, balls, horns, etc.

Use whatever you have.

The directions for this “design-play” are very simple.

Get down on the floor and arrange your toys along the boards of the floor or by the corners of the rugs.

Try a design with tiddley-winks which are large, and pennies which are small. Arrange them in various ways for a border. When you find something pleasing, reproduce it on paper by cutting some shapes like those you



have been playing with and paste them on a different colored paper. Try one also with blocks of several sizes, then cut out squares of paper and arrange and paste them.

It is nice to do these things with paper of two or three colors, so that you will think of making the color pleasing as well as the form and arrangement.

Notice the designs of all kinds of things on Page 8. Try to arrange yours in other ways if you use the same objects.

Get all the practice you can, for there will be many ways in which you can use this "design-play."

Chapter II.

FEBRUARY

Materials.

Paper for Cutting—White, light and dark paper, scissors and paste.

Drawing—Blackboard and talc pencils, manila paper and pencil, colored crayon and charcoal.

Painting—Manila paper, three color box of water colors, large brush, cloth and glass.

Modeling—Clay and board.

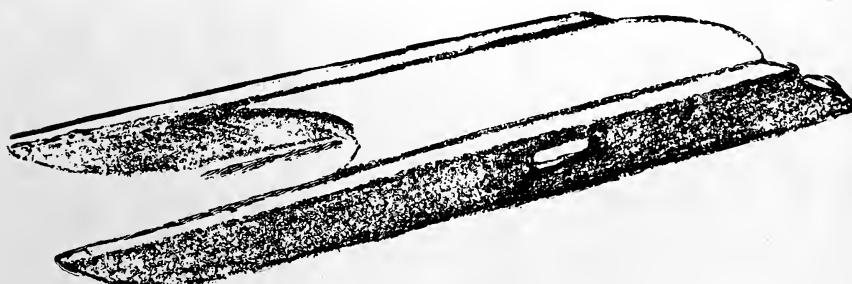
A Story to Illustrate

Winter Time

What good times some children have with their sleds every winter, those particularly who live in the country where there are plenty of hills to coast down. I have some little friends here in Chicago who had new sleds given them for Christmas, and they planned to have many good times with them. But Chicago is a sadly flat city for coasting, so after a few days of fun the sleds were in a fair way to be forgotten, until one of the children, Elizabeth, thought of a fine idea, and said, "Let's make a hill." So they all set to work—Robert, Mary, Lindsey and Elizabeth, and even baby helped. They rolled snowballs, large and small. The largest one they rolled until it could be pushed no further; then Robert piled all the snow he could upon it with the snow shovel. Then the next one in size was rolled up to it, and the next and next, and the places between the balls were filled in and packed hard, and water poured all over it to make it smooth and slippery. Mother watched them from the window cutting some steps at the back of the largest ball, and saw them help Elizabeth up to try it. She saw them coast all the way to the end of the yard, and feared that they would bump into the back fence, but they steered through the gateway every time and out into the open lot. Such good times as they had! But one sad day the sun came out brightly and the hill melted away.

Do you not think a snow picture will be a fine one to cut? Let us use three shades of paper this time—gray paper for the background, white paper for the snow, and dark paper for the children. Just notice when you are out of doors how dark the children's winter hoods and coats look against the pretty white snow.

Try to cut a picture of the children rolling the balls. They should push very hard,



leaning up against the big balls with their whole weight. Then try one of the hill when it is finished, Robert standing by with his big snow shovel. Have one of the children coasting down the new-made hill.

You can make some interesting pictures on the blackboard, making the white snow with your talc pencil and erasing the whitened surface to make the children. If you get tired trying to make the pictures, cut snow shovels and sleds and caps from paper.

Also try to draw these objects on your blackboard as well as cut them. Practice over and over. Look at them on your chart and in this book, and then get your own sled, your cap, your brother's cap or father's hat. The more you draw the better you will be able to do it.

Portfolio for Paper Cuttings

Now, would you like to make a portfolio to keep your paper pictures in? I think you could do it, with perhaps a little help. Take some heavy wrapping paper and fold it like a book. Now I am going to tell you how you can make a design for the outside so as to make it pretty. The Indians weave beautiful designs in their blankets, their baskets, and



CLIMBING THE SNOWPILE.

paint them on their pottery. Perhaps you can find some pictures of some of their designs, and see how very simple they are. Many are made with straight lines.

Try some yourselves. Take some tooth-picks, break them into inch-long pieces, and arrange them in groups for a border; straight up and down, slanting or horizontal. Then cut some white or bright colored pieces of paper into small strips or triangles, and try to arrange them in borders. When you make a good design, paste it on your cover. Below the border near the top, print the words, PAPER CUTTING, and each time you make a pretty good picture, put it in your portfolio that you have made yourself. You will find a good place for it in your desk with your paper.

For the Older Children

In object-drawing we give you this month as a suggestion the snow shovel. Notice that I say as a suggestion, for I do not wish you to think that the illustrations and the

pictures on your chart are there simply for you to copy. When you do this, you can only get one position, and you are doing something that someone else has already done. Use whatever objects I mention merely as suggestions, and do much more or you will miss a great deal. Take the objects themselves; you all have them about the house. Place them in different positions and practice some every day, both on your blackboard and on paper. It must be fine to have your Chautauqua Industrial Art Desk with all your materials where

you can put your hand on them, so you never waste time searching for them. Remember that this object drawing or any free-hand drawing gives you confidence and facility for your composition and design.

Try an illustration of the story, "Winter Time," or, if you prefer, take for your subject some winter scene you may have seen yourself. Tobogganing or skating, or perhaps a bright winter sunset, with a foreground of snow, a house and trees in the distance.

Try it on the blackboard. Place the figures in different ways, making them of one tone, the sky of another and the foreground of snow a third. Just have a good time and make a number. I think you could make four on your blackboard and see which you like the best. Then try some on paper. If you try a sunset, use your colored crayons on paper. Do not be discouraged because you cannot make pretty pictures. Do the best you can and keep right on. You will soon find yourself observing everything about you more keenly, because you have tried to express yourself and were not able to do so.

Chapter III.

MARCH.

Materials.

Paper for Cutting—White, light and dark paper; scissors and paste.

Drawing—Blackboard and talc pencils, manila paper and pencil, colored crayon and charcoal.

Painting—Manila paper, three color box of water colors, large brush, cloth and glass of water.

Modeling—Clay and board, 10x10 inches.

A Story to Illustrate

The Rabbit and the Tar Wolf

Long ago when the Indians were a great people living close to the soil they talked to the furry and feathered creatures of the wood, "learned their names and all their secrets," and told these stories to their children and their children's children. One of these legends I am going to tell you.

Once upon a time there was a terrible drouth in the land, the rivers and brooks were all dry. The animals suffering for lack of water came together in counsel and decided to dig a well. All agreed to this but the white rabbit who was a lazy fellow and probably afraid of soiling his new-white fur. He said that all he needed was the dew. Some time after the well was dug, the animals noticed that the water was getting low too quickly. They believed that someone was stealing it, and felt sure it was the rabbit, as they noticed how very slick and handsome his coat was kept. They decided to scare the thief, whoever it might be. To do this they made a wolf of tar and set it out by the well. At night when the rabbit came to get some water, he saw something large and dark by the well and said, "Who's there?" No one answered. "Who's there?" He said it again louder, and growing bold he went up and struck the wolf with his paw. His paw was caught in the tar, but he pulled with all his might and said, "Let me go or I will kick you." He then kicked with his hind legs, until he was so caught in the tar that he had to stay there until morning. Then all



the animals gathered about him and made sport of him and said they would kill him, but as soon as he was released from the tar he got away.

There is surely no one who needs to be told what a rabbit looks like—perhaps some of you have rabbits for pets. At Easter time you have seen them in the stores, sitting erect and holding baskets of small eggs in their paws. You will find a drawing of one on page 13 and others through this book. You have seen many pictures of them and possibly laughed at their funny short tails and long ears. There is a story that when the rabbit was made, so much material was used for the ears that there was only enough left to make a very short tail.

Try cutting the rabbit of white, a black wolf and a gray sky with the white moon. Try another in which the moon is the only white in your picture, leaving the sky and rabbit gray and the wolf black. You might try one where the animals come in the morning and



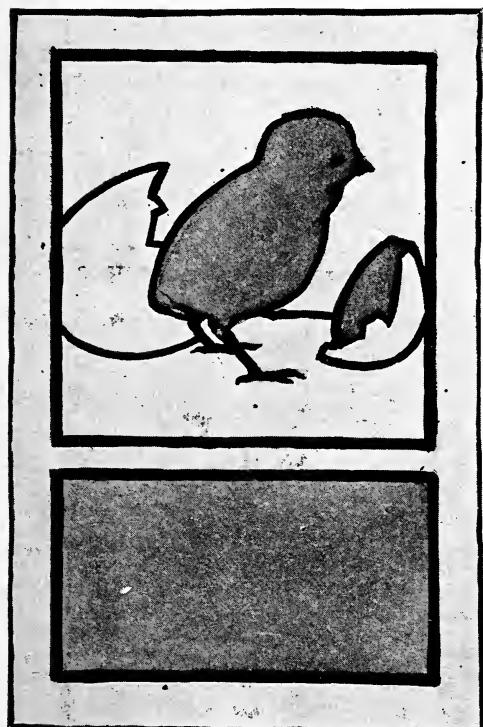
The Rabbit and the Tar Wolf

find the little white rabbit stuck against the black tar wolf. See how many different animals you can think of that might have been there. Make a number, hunt up pictures of all kinds of animals and make use of them.

This would be a fine subject to model. If there is any clay to be had, get some and try it. The clay should be moist, but not sticky. You must knead it thoroughly, taking out all the little stones. When it is smooth, put a lump on your board and spread it out about an inch thick all over the board, then heap up more clay in a nice pile where you want your animals to be, and begin to shape it gently with your fingers. You will soon begin to see the wolf's pointed nose, and the back of the rabbit with his stubby tail. The long ears of the rabbit may need to be supported. If so, put in a piece of toothpick and build clay around it. Do not try to model the animals standing up, you will find their legs will not support them.

I have spoken only of paper cutting and modelling. Do not forget that you can always

practice these pictures on the blackboard, also. If you have colors, so much the better. Then you can paint them. Try to keep your colors simple. Do not try to show the eyes, nose and mouth of the animals, but work hard to get the shape of them, their heads, their backs, legs and tails.



A Design to Fill a Square

your mind. Think hard of rabbits, large rabbits, small rabbits, rabbits running, rabbits jumping and sitting on their haunches. They will not be hard to draw. Remember that they have very long ears, and very short and stubby tails. Their front legs are quite short and their hind legs very long.

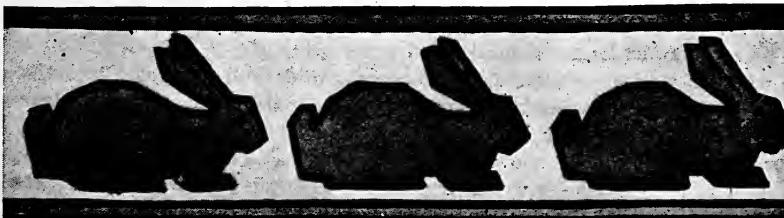
To Decorate Easter Cards

MATERIALS—Cardboard or good heavy paper; tracing paper; pencils; water colors or crayons.

Draw a rabbit now, after much practice, the right size to repeat many times and make into a border on a card. Take a piece of thin paper and with a soft pencil trace this rabbit



Big Bunny



A Suggestion for a Border of Rabbits

then turn it over on your card and with a hard pencil draw on the back of your tracing paper over the lines you have already drawn, lift your paper and you will have on your card an impression of one rabbit. Move your tracing paper to the next place, and the next, until you have finished your border. Then go over the whole impression with pencil or ink.

Another suggestion for an Easter card is to make a drawing to fit a square. Use either the rabbit or a little yellow chick. Draw the square shape on an oblong card and you will have room below to print an Easter greeting. Since this is a decoration on a flat surface, use flat colors, just as if it were cut out of paper.

* * *

Suppose we take a winter landscape for our subject and make an illustration. Try one



A Winter Landscape

every day for at least a week, making a conscientious study in chalk, water color or black and white of each day as it has impressed you.

Notice the sky in relation to the ground. Which is darker? Are the trees, houses, or other objects darker or lighter than sky and ground?

You will find it most interesting to try these studies, and after each attempt, when you are out of doors, make mental observations and apply these on your next sketch. Notice late in the afternoon the color in the western sky. If there is any sunset glow, see how that color is reflected on the snow and on all objects. You will learn much if you are thoughtful. Use the same ideas we have given the little ones and do them faithfully. Your compositions will improve if you spend some time every day on object drawing. This may apply to students of all ages, and the objects may be widely varied: Fruit, vegetables, flowers, books, jugs, all kinds of household articles, or people and animals, if you like.



Draw, draw, draw, every chance you have, and anything you see, not recklessly, but thoughtfully, so that you may improve in dexterity as well as in perception and observation. Never use paper smaller than 6x9 inches, and larger if you have it.

We have suggested to the little ones to decorate Easter cards with rabbits or little chicks. Perhaps you would like to try this also—or if you prefer, use flowers. Study the flowers very carefully first. Take tulips, daffodils or lilies. When you feel that you know the flower quite well as to form, make your design of the flower form.

Remember that when you decorate a flat surface you must use flat colors. Think of the space you wish to decorate, try various ways of filling the space until you find a pleasing arrangement. If you do any lettering, such as *Easter Greeting*, or *Happy Easter tide*, be sure to do it as neatly as possible and in very simple lettering.

Chapter IV.

MATERIALS.

APRIL.

Paper for Cutting—White, light and dark paper; scissors and paste.

Drawing—Blackboard and talc pencils, manila paper and pencil, colored crayon and charcoal.

Painting—Manila paper, three-color box of water colors, large brush, cloth and glass of water.

A Poem to Illustrate in Paper Cutting

*Oh, it's I that am a captain of a tidy little ship,
Of a ship that goes a-sailing on the pond.*

*And my ship it takes a turning all around, all around;
But when I'm a little older I shall find the secret out,
How to send my vessel sailing on beyond.*

Some day when there is a light, warm breeze you will take your little sailboat with a string tied to it, or a stick in your hand to guide it by, and will watch it sail on the brook or pond. Now just imagine how you will do it and try to make some pictures with your paper. Use three colors of paper and try in different ways. You will likely find that you will have to cut many little boys and girls before you get a good one. Make the figure bend over as it watches and guides the boat. Try one kneeling reaching over the water; do not be afraid to try. As for the boat, I dare say you can make a better one than this illustration, for we grown folk do not play with boats.

Perhaps some of the boys that have no boats would like to make one. Then get a block of wood and cut it into the hull. That will be the hardest part. Then you can find the mast and make the sail. After you have practiced drawing them you will know just what kind of a boat you want.

As there are so many flowers at this time, let us study some of them. Daffodils and tulips are good large forms to draw and can be made very decorative if we wish to use them for that purpose. Spend all the time you can every day—first on the blackboard of your Chautauqua Desk, to get the general form, then on paper and with color, either crayons or water colors. Make a nice study by putting one or two flowers and some leaves in a vase



The Poem Illustrated in Paper Cutting

with a good light on them and do your best, either in black or white or in colors. Perhaps you would have time for both.

For illustration try the following poem:

*"I am a giant strong and bold,
Such jokes I play on young and old,
And I work hard from sun to sun,
And one must have a little fun.
Sometimes a boy I chance to meet;
I blow his hat across the street,
Then toss his kite up to the sky,
And help his mother's clothes to dry."*

There are a number of pictures suggested in these lines. There is the boy on the street with hat flying from him, or the boy running after it, with houses on either side of the street, and perhaps an occasional tree. Be careful of the size of your boy in relation to the houses and trees and try to show perspective by making things far away smaller than those near-by. Mother's clothes blowing in the wind would make a good sketch, too.

This month begins to suggest spring. An occasional robin is heard and the children are jumping the rope and playing marbles and ball, hide and seek and tag. Try in your cutting

and drawing to make a picture that will show one of these games. If you find it very hard, run out with some of your playmates and play the game. Watch the other children play. Then come in and try again. Show the *action*—that is, whether the children sit or stand, or run or jump.

Do not try to draw the faces. It would be very enjoyable for three or four children to try this together. One could run, the others watch him and then try to draw a boy running, or tossing a ball, or kneeling on the floor playing marbles. Notice carefully the action of the body.

See how few lines you can get along with.

Think whether the figures are dark against light, or light against dark, and then try without lines just to put in the tones.



A Suggested Picture

Watch everyone about the house, everyone in the family—mother dressing the baby, sister washing dishes and brother bringing in wood.

Look at them for a minute, then shut your eyes and try to see the picture in your mind. Then hurry and put that picture on your blackboard or on paper. You will really find it good fun, and if you do it often, day after day, you can learn a great deal.

* * *

It would be a good idea for the older students to spend all the time they can spare this month in sketching from life, in charcoal, water color or chalk.

Try to get some one to sit or stand quietly for fifteen minutes. Notice these three things:

Action—Find the large lines of the body from head to feet.

Proportion—Think of the size of the head compared to the figure, the length of the arms and legs.

Values—The light and shade as compared to black and white.

Do not try to go into detail very much at first. Think of the *whole*.

When you can get fairly good proportions in your figures you may go a little further and suggest very simply the placing of the features.

Try to practice some every day. If you can get no other model, stand before a mirror and sketch yourself in different positions. The great artist, Rembrandt, made hundreds of sketches of himself and some very important paintings. Rapid sketching is very good practice. This does not mean that you shall allow yourself to work carelessly, but think of what a person is doing and try to represent that with as few lines as possible. If you do not succeed, try again, many, many times.



A Game of Marbles

If you are interested in drawing, if you really care to learn to draw well, get into the excellent habit of drawing—drawing every chance you have. The more you draw, the more trained your eyes will become to the truths in form and color.

* * *

COMPOSITION.

Do you know the story from Aesop's Fables of the dog crossing the river with a piece of meat in his mouth? He looks down into the water, sees his reflection and thinks it is another dog with a piece of meat like his own, and greedily, wanting both pieces, he "chops for the shadow and loses the substance."

Materials—Blackboard, *talc pencils*.

Drawing—*Charcoal and manila paper*.

Painting—*Three-color water color box, manila paper, or water color paper, large brush, cloth and glass*.

Try to make an illustration from this story. Do it as simply as possible, using three flat tones. Charcoal is a good medium, although you can do it in pencil or color if you wish.

A good illustration must do two things: It must fill the space agreeably and tell the story. By saying it must fill the space agreeably we mean it must be a pleasing arrangement of dark and light spots. Try to think of balance. Remember that something heavy and dark on one side of your picture calls for balance on the other side, not just as heavy or just as dark, because you can often make a more pleasing arrangement by sending the balance farther away and then it need not be so large, the same principle as the see-saw. You know a large person must sit nearer the center to balance the small person.

As the dog is over the water, he must be on a bridge, a board or perhaps on some



Dog Crossing the River with Meat in His Mouth

stones in a river. He must look down into the water. You might try one picture showing that he has dropped his meat. The water would then show ripples in circles. Make a number of arrangements, filling certain spaces. Try them on the blackboard in small spaces, to see what arrangement pleases you best. If you really are intending sometime to make pictures, nothing will help you so much as to make them now. Be honest with yourselves and every chance you have study good pictures, if not in real paintings, in photographs.

You will realize, too, more and more, as you try these lessons, how much you need to know how to draw.

Chapter V.

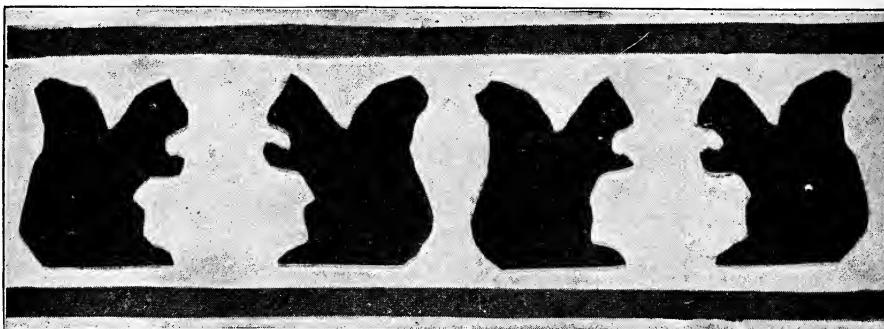
MAY.

*Howdy, Mister Flop-Toad! Glad to see you out!
 Bin a month o' Sund'y's sence I seen you here about.
 Kind o' bin a layin' in, from the frost and snow
 Good to see you out ag'in, it's bin so long ago!*

—James Whitcomb Riley.

We will this month make animals our special study. If you live in the country you will be able to see cows, horses, perhaps sheep, rabbits and squirrels, and all kinds of birds. The children who live in the city or town will not see so many kinds of animals, but wherever there are people there always are some animals. Dogs and cats are everywhere, also chickens, geese, pigeons, robins and sparrows.

Perhaps you have a cat and kittens of you very own. Do you give them their bowl of milk each morning and watch them lap it up contentedly? And then, how cunningly they play, rolling over each other, jumping on their mother's back, and patting her with their little paws. Do you feed the chickens? Watch them as they peck and crowd each other. They are very selfish and quarrelsome little creatures, as you may have noticed, all but the



The Frolicsome Squirrels

mother of a brood of little chicks. See how she helps them to get enough to eat, scratches for worms and then calls for them to come.

Every day watch them for awhile—any animal, any bird—and see what you can learn about them. Then try to tear some out of a large piece of paper, any color. Just see how nearly like the real animal or bird you have studied you can make one of paper. Tear many pieces and try to have them doing something, a chicken pecking, a rooster with his head high in the air and mouth open, crowing. Try drawing them on the blackboard of your Chautauqua Industrial Art Desk, when you are in the house. You will surprise yourself many times.

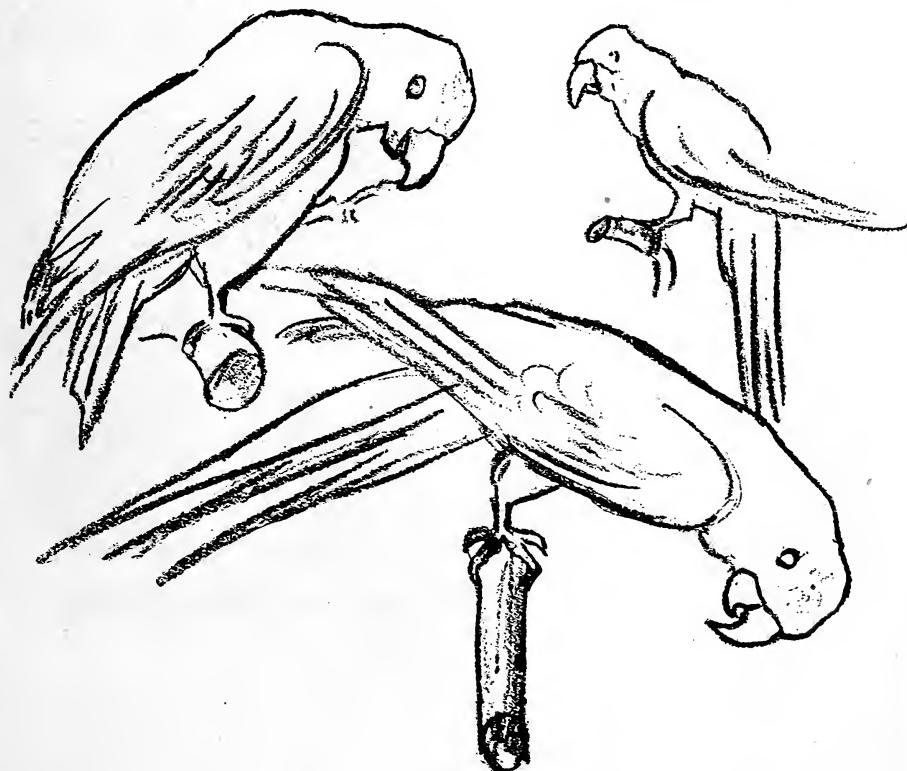
After you have made many in tearing and drawing, try cutting them out of dark paper. If you get one that you like real well, cut many more just like it and keep them in your portfolio, for you will use them later.

Chapter VI.

JUNE.

Have you ever noticed how many different kinds of animals there are at the circus? You will be surprised if you count them. There are large animals and small ones. Some are slender, with long necks and small heads. Some are clumsy and large, with big heads and feet. Notice all the peculiarities and when you reach home try on your blackboard to sketch as many as you can remember. Then take a large piece of light paper and tear

some or cut them with scissors. Pin these on a dark wall or curtain and see if your parents can guess which animals they are. It would be great fun to invite some of your little friends that have also been to the circus and all try together. Then when you have quite a collection ask your parents to choose the best one, two or three and perhaps they would give a little prize.



PARROTS

Drawn by a Student in the Art Institute of Chicago

This *animal game* need not be limited to circus animals, it can be applied to the barn-yard animals, if you live in the country, or to the tame animals that even the city children come in contact with, cats and kittens, dogs, canaries, your Polly, or perhaps you have white mice. Play with your pets and then leave them and see if you can remember how they look. Do your very best, and after you have finished you will not be satisfied. Good! Then look carefully at them and see if you can find out yourself what is the matter with your drawing or cutting. Why does it not look right? Ask yourself all sorts of questions. Is the body of your dog too large or too small?

Have you forgotten his ears?

Are the ears in the right place?

Is his tail long or short?

Are his legs long?

After you have found out what is the trouble, try again.

Try these animals in many positions—running, standing, sitting, eating and sleeping. Practice every day on your blackboard and on paper in drawing. Tear or cut the animals out of paper. Model them in clay or plastina.

Then remember your lesson on "Animals in Design," to make borders or decorations for Easter. Look back to this lesson and apply it to any of the animals you have been drawing. This time make a border all around a book cover, so that you may arrange the corners. You will enjoy trying this. Notice the designs with chicks in different tones. Try this also.

Tear or cut a number of some one animal just alike.

Then arrange them in various ways, by laying them all around the edge of a large book, facing each other, so that they look like pairs, chasing each other around, etc., etc. You will think of ways when you are busy, and when you find one or two really alike, take paper of two different colors and make your design by pasting light animals on dark paper or the opposite.

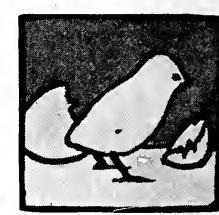
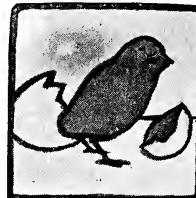
Make your arrangement between two dark lines drawn evenly all around your paper.

* * *

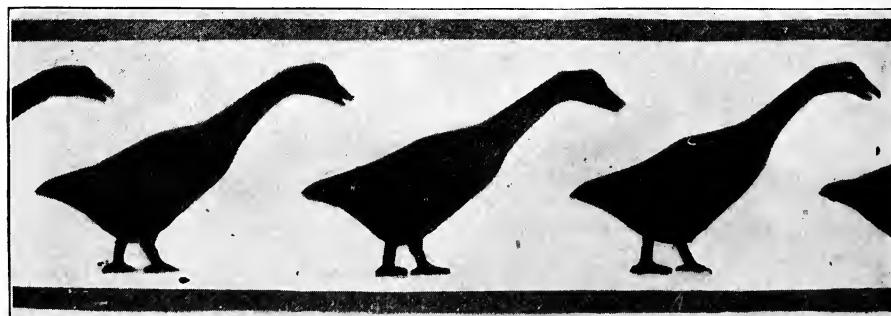
You will not be sorry that this month's lesson will take you out of doors much of the time. The weather may not permit outdoor sketching, which requires sitting still a long time, but you can safely make *Observation Trips*.

If you are so fortunate as to live in the country or in a small town, take a friend or two and find your way to a good-sized farm. Carry with you a small pad or sketch-book and pencil and make all the quick sketches you can in the barn-yard. There will be cows, pigs, perhaps sheep, chickens, pigeons, geese, ducks, etc., etc. Follow them as they move about and make numerous quick sketches, showing their habits and characteristics.

You will find in studying these ever-moving animals that you will be obliged to do much of the work from memory, so do not try to make any finished sketches, but in as few lines as possible represent the main proportions and the action. If you ever have a chance to follow a flock of sheep you will find it very enjoyable to sketch them, especially so if there should be some lambs. Notice how clumsy they are and yet not ungraceful as they gambol and play, their legs are so long and their heads so large.



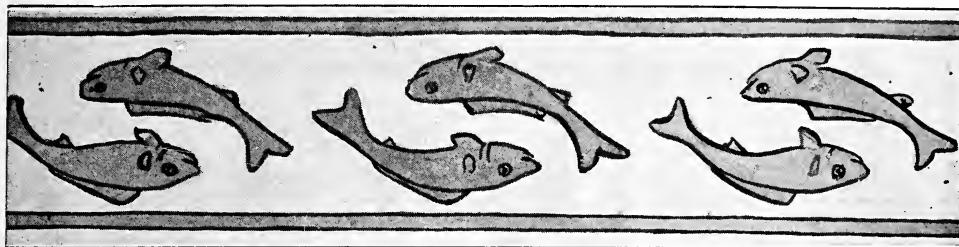
Designs Showing Different Tones



A Line of Geese

Another way to study, and a very good one, also, is to take no paper, but observe as keenly as possible and on your return put down your impressions.

Think carefully of making as pleasing an arrangement as possible, balancing the dark and light and not cutting the paper right in half by horizon line. As this is an animal lesson, try to get the character of the animals, and give them an important place in your composition. Save your animal sketches. You may wish to use them some time for decoration. You can apply them as you would flowers, fish, or shells to borders, squares and circles. The Japanese use them constantly in their designs.



A Border of Fish

Chapter VII.

JULY

*Ring out the joy bells! Once again
With waving flags and rolling drums
We greet the nation's birthday, when
In glorious majesty it comes.*

—Marie E. Vandyne.

With the coming of the Fourth of July, our nation's greatest day, all the children will be interested in playing soldiers, having parades and other patriotic celebrations.

A parade is fine fun. With drums beating, flags waving, feet marking time, and all alert and ready to obey the commander, it is a fine sight to see. If you have no drum, an old tin pan will do, and for a flag a napkin or gay colored piece of cloth. A parade is a celebration which surely no boy or girl should miss.

Now for your lesson. After having enjoyed a real parade, try making pictures of one.

MATERIALS.

For Paper Cutting—Paper of several colors, scissors, paste.

For Drawing—Paper, gray, if you can get it; charcoal; white chalk; eraser, a soft one.

Get all your materials ready, and then sit and think. If you think hard with your eyes closed you will be able to see a picture of that parade in your mind. Try to remember who was the tallest and who the smallest, what each one carried, how you marched—two by two, all keeping time. Then take your materials and make your picture. Do not stop at one, make a number. If you are drawing, do not forget your blackboard. It is so fine for quick sketching. Then take your paper and try your very best to make a real patriotic parade.

* * *

It is a very good idea to learn to connect your drawing with your school work—history, botany, composition, anything. You will find that both the drawing and the lesson will become more interesting.

To show how well this can be done, let us take a story in American history. As the Fourth of July approaches our thoughts will lead us to the Revolutionary War. There are many incidents that you could try to illustrate: Paul Revere's Ride, Washington taking

HOME SPHERE OF CHILD LIFE

command of the army under that magnificent old elm tree in Cambridge (which may be seen there today), Washington crossing the Delaware, or at Valley Forge. Look up some old pictures for the costumes of that time, so as to make it as consistent as possible.

Our illustration is of Ethan Allen taking Fort Ticonderoga. This is a good story to know, being one of the cases where punctuality and shrewdness took an important fort without shedding a drop of blood. It was near the beginning of the war. The British held the fort, and by holding it had control of the lakes between the Hudson River and Canada. The Americans were quick to see how important this was, and Ethan Allen was appointed to take the fort. He was then in the mountains in Vermont, with a band of brave men, since known as the "Green Mountain boys." Some men were sent up from New York to join them, and on May 8 they marched to the neighborhood of the fort. Early in the morning of May 9, when daylight was just appearing in the sky, Allen called his men together and asked those who were ready to go with him to raise their guns. Every gun



Ethan Allen Taking Fort Ticonderoga

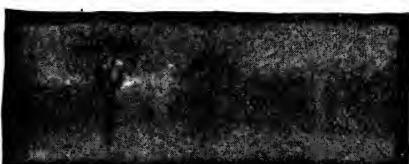
was raised. Losing no time, they started for the fort. They rushed through the wicket formed on both sides of the parade, and raising an Indian warwhoop, so took the place by surprise that the sleepy inmates immediately surrendered to Allen's demand in the name of the "Great Jehovah and the Continental Congress."

In the drawing which we show, the soldiers are rushing in through the wicket. It would be equally interesting to show them marching at daybreak toward the fort, or where they raise their guns. Choose the incident that appeals most to you, and make numerous quick little sketches. When you have one that pleases you, try it larger and spend more time on it. Keep the masses of light and dark as simple as you can. Do not put in too

much detail, but try to get the spirit of the story, the action. Remember that the places you notice most in a picture are where there is the greatest contrast of light and dark or color. It is for this reason that you notice the heads of the men in their three-cornered hats and the sharp pointed bayonets as they come against the light sky.

* * *

Let your drawing take you out into the air this month, to study and observe the sky,



Landscape Drawing

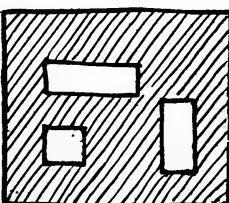
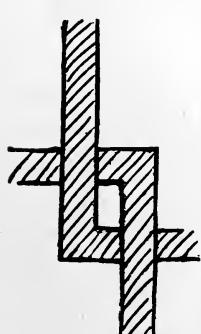
the clouds, the sunshine on the trees, the winding country roads, the hillsides or stretches of flat prairie. There is beauty everywhere and we can all learn to see it if we will.

Use any material you wish. Nature is so full of color that it seems most natural to work in oil or water color, but if you would rather use black and white, or can not get colors, you can really do very good things in charcoal or pencil-charcoal on white paper, or charcoal and chalk on gray paper.

* * *

You will need a finder. Notice the sketch of two different kinds.

One is a piece of cardboard with three different shapes of holes. You look through these to choose your picture in the landscape.



Finder

The other is two triangular pieces of cardboard which you can move about to make any shape or size you wish. This makes a frame for your picture as you see it in the landscape. You can make your frame larger by bringing it closer to the eye, and smaller by moving away. Decide on the shape of your picture and mark off on your paper a light line for your picture limit.

Now, half close your eyes and look through your finder carefully, then close them and see if you can remember just how the landscape looked. Look again, if necessary, until you can really see that picture with your eyes closed.

Then place it on your paper or canvas, not looking up until you have drawn the general masses as you remember them. When you look again, compare carefully your start with the picture before you, and make the changes. If you find you are entirely wrong, start another. You will find it very interesting to test your memory in this way, and splendid training.

Whatever you are studying—landscape, still life, flowers, etc.—keep in mind these four things: Proportions, values, character, and simplicity of treatment. In landscape, a fifth may be added, *perspective*, things near in relation to things far away, not only in size, but in values.

Notice the *simple* masses of foliage, not the separate leaves.

The *simple* value of the ground, not the individual grasses, etc.

Is the value of the sky lighter or darker than the ground?

Is the house lighter than the ground? Lighter than the sky?

Notice the difference between sunlight and shadow.

Notice the character of the trees. Are they tall and slender? Are they broad, with very heavy foliage? Is the trunk massive? Do the branches all show, or are they hidden by the foliage?

If you have not sketched out of doors all these questions and suggestions may seem confusing. After reading them do not tax your memory too much, but go out and sketch *every day*. And each time you come back, read over this lesson and you surely will get suggestions for the next time. Do as much outdoor sketching as you can all through the summer, and do not confine yourself to landscapes. Use the animals in the pastures, the wagons on the road, the children playing in groups, perhaps bathing if you are near a lake or river.

If you are in the city, try to get to the park. There are always interesting subjects. Look for them and use them whenever you can.

Chapter VIII.

A Story in Paper Tearing

AUGUST

Materials—Paper of several colors, paste and scissors.

The paper should be harmonious in colors, picked out to suit the story. You would use very different colors to paint sunset than for a rainy day. Think of this when you choose your colors, for you will use your pieces of torn paper just as if they were paint. Perhaps you can buy a pad with different colored papers. With two or three good colors you can make a very good effect, like a poster.

The picture here is to illustrate a poem about the March wind and its various pranks, turning umbrellas inside out, etc. A sheet of grayish blue was used for the sky, and the other colors were torn with the fingers and pasted on. Some of the edges were cut and some torn.

Torn edges are better for clouds and trees, while houses and figures look better when cut with the scissors.

Listen to this story, then close your eyes and see if you can remember a picture to cut and tear that will tell the story as well as words.

High up on a hill in a little brown hut lived a little old woman. She was very old and very wise. People used to go to her with questions, and the answers she gave were always wise and good.

Two little girls, named Goldenhair and Blue-eyes, wanted to know what to do to make every one happy. They had heard of this little old woman, and decided to ask her; so one afternoon they started out, climbed the *long, long* hill to her house, and it was nearly dark when they reached the top. When they knocked at the door, very timidly, the old woman came to the door, and asked sternly what they wanted. The little girls were very much frightened and could hardly speak. Finally Goldenhair said: "We want to make everybody happy." "And we want to stay together," Blue-eyes added.



To Illustrate a Windy Day- For the Paper Cutters

After they had spoken it seemed as if the little old woman smiled kindly, and it is said that she opened the door and led them into the house. The next morning the hillside was all covered with goldenrod and blue asters waving and nodding in the sunshine.

The two little girls were never seen after that night, and when people asked about them it was said that the goldenrod and blue aster growing side by side, and whispering together, might be able to tell where they had gone if they only would.

This story could have two or three illustrations:

One could be of the hillside and the little hut in the evening, with the hill and house in dark color, and the sunset bright in yellow or red behind it. The children might show with their dark heads against the sky as they were reaching the top of the hill.

Another: In the morning the picture might show the hill all purple and gold in the sunshine and the blue sky behind. How beautiful that hillside must have looked.

* * *

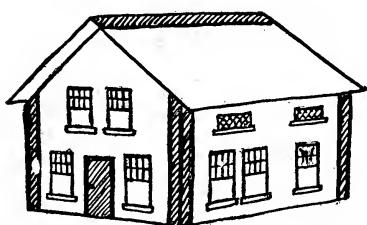
Some of you have clay to play with, others have sand piles where you can dig and build.

*A miniature town and countryside.
I called the little pool a sea,
The little hills were big to me
For I am very small.
I made a boat, I made a town
I searched the caverns up and down
And named them one and all.*

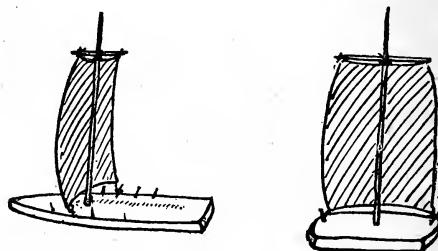
Perhaps you have a chance to play on a sand beach and can say like the little boy in the poem:

*When I was down beside the sea,
A wooden spade they gave to me
To dig the sandy shore.
The holes I made were like a cup
And in them all the sea came up
Till it could come no more.*

Wherever you may play, that is if you have anything like sand to play in, you will enjoy building a village with an expanse of country back of it, showing hills and winding streams and roads. Model the hills with your hands, plant your trees, using tiny twigs or tooth picks with green tissue paper and make your houses of cardboard. Then dig out your river, and make a little pool or little lake in which you can sail tiny boats. These little boats you can



Suggestions for a House Put Together
With Passepartout Paper and With
Painted Windows and Doors



Boat Showing Simple Arrangement
of Mast and Sail

make yourselves. Take a small piece of wood and cut one out. The bow should be pointed and the stern broad. Use a toothpick for a mast and a tiny sail of white or colored cloth. In foreign countries the sails are usually stained yellow or red and look very pretty.

August is the month of rich colors in fruit and vegetables. You will benefit greatly by using them in your study of free-hand work.

Arrange some interesting studies. Try to combine objects that are suitable. Kettles and pans go well with vegetables, such as beets, turnips, onions and carrots. Do not cut the green stems and leaves off the vegetables.

Dishes can be used with fruit—pineapples, pears, lemons and peaches. Use simple backgrounds, a piece of paper slightly tinted, or a dull piece of wood does very well. If you will think of the background as part of your study, you will realize that it should not be startling or too prominent.

In arranging your studies, think of balance, harmony and unity.

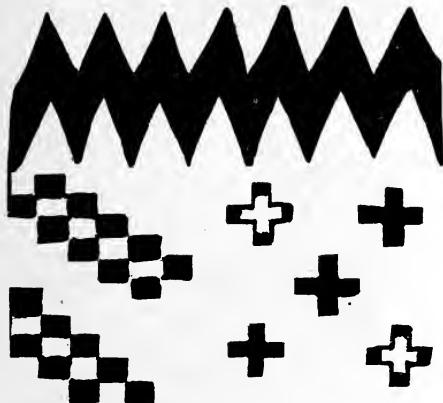
Balance—Think of a “see-saw.” If a large person is on one end and a small one is on the other, the large one must be nearer the center in order to balance. This holds true in your arrangement of objects for a study.

Harmony in Color—Let all the objects have something of the same color running through them or else a very pleasing contrast. Use the color schemes that nature offers in the particular fruit or vegetable you wish to paint.

Unity is “oneness.” Placing your objects in such a way and arranging the light and shadow so that the group is held together. Think of making a picture of a *group*, not of several individual objects with spaces between.

Chapter IX.

SEPTEMBER



Some Geometric Forms from Indian Baskets

of animals and birds, which they only killed for food and clothing.

One part of this poem tells how Hiawatha, the little Indian boy, made his canoe, getting from the birch tree its bark; from the cedar its strong, pliable boughs for a frame-work; from the larch tree, its fibres to sew the bark together, and from the pine tree its tar-like resin to close the seams and make them water-tight.

*Thus the birch canoe was builded
In the bosom of the forest
All the forest life was in it
All its mystery and its magic,
All the lightness of the birch tree,
All the toughness of the cedar,
All the larch's supple sinews,
And it floated on the river
Like a yellow leaf in autumn,
Like a yellow water lily.*

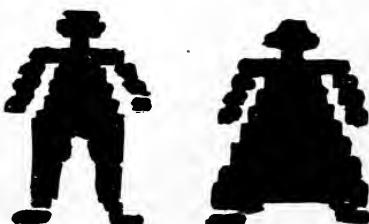
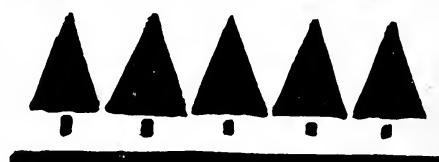
Learn as much as you can about Indians, then try to build or model an Indian camp. Make groups of wigwams (Indian tents) of cloth instead of animal skins, using tiny twigs for the frame-work. Set a "Totem-pole" in the center of the camp, with bright colored pictures of canoes and animals painted on it.

Tiny canoes can be made of birch bark. If you cannot get that, use yellow pasteboard. Paint this and it will float in the water. Sew together with a darning needle and string, on which you should rub wax or resin to make it strong and water-tight. Make the sides spread apart by putting it over a bottle or piece of wood the right size while it is wet, and allow it to dry in this shape.

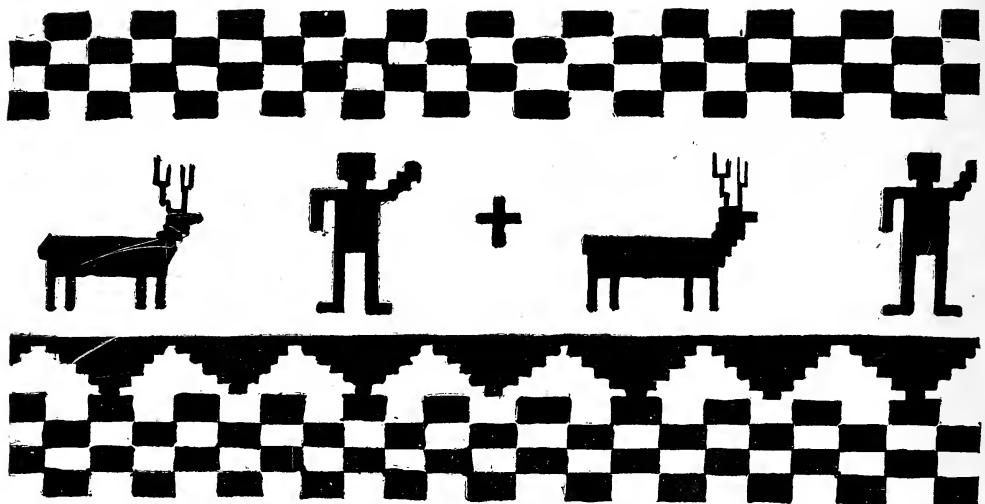
You may find this canoe so light that when placed in water it will be inclined to tip. You will then place a little stone or weight in it for ballast which will correspond to the weight of a person in a real canoe.

*Then the little Hiawatha
Learned of every bird its language,
Learned their names and all their secrets
How they built their nests in summer,
Where they hid themselves in winter,
Talked with them whene'er he met them,
Called them "Hiawatha's Chickens."*

What could be better sport than a wigwam to live in, with a bow and arrow and a birch-bark canoe, all made by yourself? Read, or have some one read to you, Longfellow's beautiful poem, "The Song of Hiawatha." You will thus learn much about Indian life, and you will find that they were in many ways very intelligent people. They lived very close to nature, so that they were quite familiar with the habits



Symbols of Trees, Men and Women



A Design from an Indian Basket

Now make some small bows and arrows, for every wigwam should have one or two to protect those who live in it from wild animals. Make four bows of willow twigs and whittle four arrows with a sharp point. Some of the Indian tribes made beautiful bead work and pottery. They also wove rugs in many good patterns and very bright colors. The designs were taken from the things about them connected with their lives. See in the illustrations some of their symbols.

You see they had no written language, but they told many stories in pictures on the things they made. We show some of these pictures or symbols. Try to find others in



Off for School

books, or perhaps you have some Indian objects in your homes. With your clay model a bowl or water bottle such as the Indians may have used and cut a simple design around the edge with a sharp pointed stick or some simple repeat form between two straight lines.

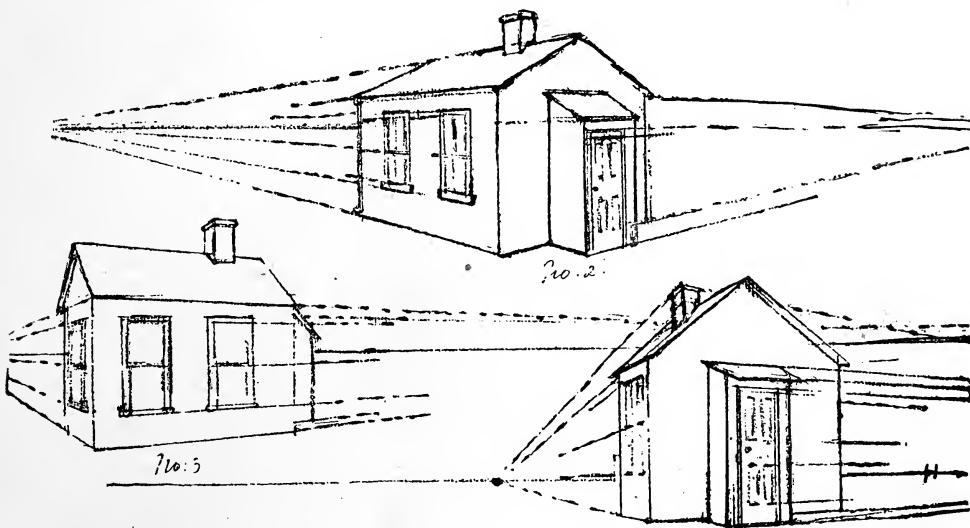
Color your design with one or two bright colors of your chalks. Dry your clay object in the hot sun and it will last for some time. Let your drawing and modeling in September be of incidents in Indian life.

* * * *

We show you a charcoal sketch of children going to school. Try some yourself. You see them every day. Study them alone, and in groups, and when you get home try to remember them on your blackboard or on paper. Do not be discouraged if you cannot make pictures; just keep on trying. Think of what you wish to say in your picture and make the important part; then balance this figure or group of figures with something less important. If you cannot satisfy yourself, all the more reason for practicing. In time you will gain and be able to express yourself in drawing as well as in speaking or writing.

The Study of Perspective

Does the perspective of houses puzzle you? Try to remember that everything far away is smaller than things near-by. You know that very well, but we all forget the most simple things sometimes. Beginners always draw things as they know them to be, not as they



PERSPECTIVE OF A HOUSE

No. 1, from the Front; No. 2, from a Corner; No. 3, from a Side.

look. For instance, an open book lying flat on the table is not the same as a book open standing on end, and yet it is most always drawn that way until one has learned to see. A house, tree, or any object near by is very much larger than those far away. Notice as you walk along the street or the country roads how the lamp posts and telegraph poles become smaller and smaller in the distance. So in drawing a house the part nearest to you is larger than the part turned away. Study carefully No. 1 of the illustration of house in perspective, think where you would stand in relation to it, and see how all the lines above your head, the roof lines, the top of the windows, and even the middle of the windows, slant down. The lower lines slant upward. Your eye would be on a line with the lower part of the windows, which is the level of the horizon. In No. 2 you will see that the level of the horizon is higher, for even the roof lines slant down very little. Your eye would be

about on a level with the top of the windows, while in No. 3 your eye would be about on a level with the middle of the windows. Try to apply this principle to different things—small and large. Draw books and boxes, chairs and tables in different positions and see if you can make them look right. Save some of these drawings that you make on paper to send in some time. Study carefully the principle of perspective as given on the scroll of your Chautauqua Industrial Art Desk.

Chapter X.

OCTOBER

Have you ever noticed how full of color autumn is? All the flowers that grow at that time of the year are quite brilliant. Golden-rod and asters, "blackeyed Susans," wild sunflowers and the brilliant crimson Indian flower, sometimes called "paint brush." Then the foliage on the trees which colors so gorgeously, the rich, red oak leaves, brilliant sumac and the more delicate yellow and red maple. Keep your eyes open and discover as you never



A Nutting Expedition—For the Paper Cutters

have before the color at autumn time. The memory of it will come back to you on grey, dreary, winter days and make your heart glad.

In the autumn there usually is a blue haze in the country, caused by fires. This adds beauty to the color when seen from a distance. At this time of the year, too, we have our most beautiful sunsets. After the sun has gone down, stay out and watch the color changes in the sky. Do not think that color only appears in the west where the sun has set. Look eastward and see the color—very different, not nearly so gorgeous, but oftentimes more beautiful, for the colors are so delicate—violet, grey and pink. In such a sky we sometimes discover the crisp, white, shining half-circle of the new moon.

Let us take for our subject a picture of autumn, and this should be in color.

Materials—Manila paper, water colors and good sized brush and cloth, or chalks.

Have you ever been nutting or gathering apples? Did you ever go to a Hallowe'en party? What did you do? Bob for apples? Were there Jack o' Lanterns? Did they

tell stories of witches? Think of all the happy things that occur in the month of October, and try to make pictures of any or all. Make some every day! If you think of a subject that you like very much, try several; you will find that the more you do the easier it becomes.

If you try to paint an autumn landscape, be sure to suggest the brilliant coloring in the foliage and the blue haze in the distance.

A pleasant way to spend an hour or more every day is for three or four children who like to draw to get together with their materials and take one subject to illustrate. Each one will do something different, although the subject may be the same, and you will have a chance to learn from each other.

For the Paper Cutters

The youngest children could do it in paper cutting or tearing. If you cannot get colored papers where you live, send to some kindergarten supply store in the city for a *sample* book; then you can choose your colors and send for them.

Make your pictures as real as you can; be thoughtful in tearing and neat about pasting the different colored papers, just as an artist is careful about his brush strokes. Years ago beautiful pictures were made of colored pieces of stone put together, called *mosaics*. Picture windows are made of pieces of colored glass. Many may be seen in churches. Your picture will be made of colored paper, torn into shapes and pasted in place.

Suppose you wish your picture to be of a witch at night, out of doors.

You would use dark grey for the sky, with perhaps, a white crescent moon, a black witch with a pointed hat flying on a broomstick with a black cat behind her, or on her shoulder.

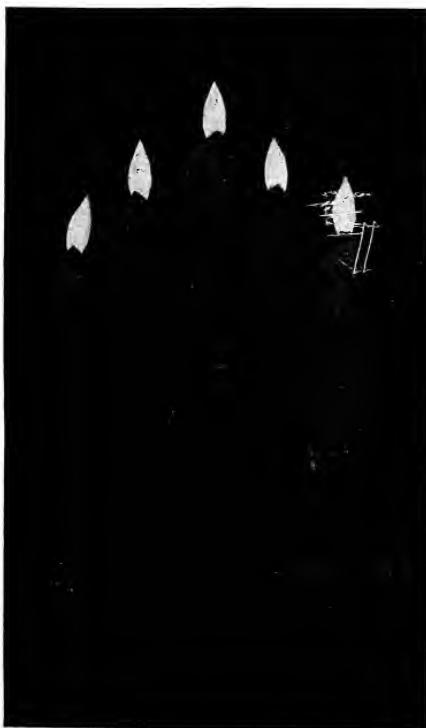
Or, for another picture, a boy with a lantern near, the boy in black, bright white light shining out of his lantern, while up in the sky, *far away*, he sees the witch. In this case make the sky and witch in two tones of grey, this will make them look far away.

Do not put too much into one picture. It is better to make many pictures, as the ideas come to you.

Draw on your blackboard or model in clay any forms connected with Hallowe'en, pumpkins, lanterns, a witch's hat, a broom, the cat, apples, etc. All these things may be used in design also. You might make some Hallowe'en invitations in the shape of a little booklet.

Make a border of the funny witches, of pumpkins, the witch's hat, the black cat or the broom.

These would be best in water colors, or of two colored papers—try cutting the design out of one color and neatly pasting on another.



Hallowe'en Party Invitation

A Lesson on Composition for a Poster

All towns have church bazaars.

Wherever there are young people, there must be parties.

Schools often have performances to which the public are invited.

A poster is a most convenient way to advertise and can be made very attractive and effective. In making a poster, a few of the requirements are:

Definite outlines; flat tones; readable lettering.

The arrangement should be such as to attract attention and hold the interest.

Let us take for a subject a Hallowe'en party. Use some idea connected with Hallowe'en, but one that is decidedly different from the composition reproduced here. Remember that in a composition as well as in design, you must consider balance, harmony and unity.

In one design lesson we spoke of one form of balance called symmetry. Another form



A Poster Picture

of balance is where a single large mass is balanced by several small spots on the other side, or a large mass near the center is balanced by a small mass nearer the end. Think of a "sea-saw." These masses may be dark or light, as pleases you best.

Stimulate your imagination by trying many, many times what you see in your mind and what you feel.

Think of harmony as a pleasing relation of colors and form. Harmony cannot easily be explained by rules. One feels that things are harmonious or that they are bad and disagreeable. Try to cultivate your sense of harmony by studying good pictures, oriental rugs, Japanese prints, etc., as well as *nature*.

In planning for your poster, make many small notes or sketches on both blackboard and paper, in black and white masses and in colors. Do a great deal of thinking. If you have an idea, work it out in several ways and unconsciously other ideas will come.

Painting and Drawing Leaves From Nature

*The golden rod is yellow,
The corn is turning brown;
The trees in the apple orchard
With fruit are bending down.*

*"Flowers are the alphabet of angels, whereby
They write on hills and fields mysterious truths."*

In October you will readily find beautiful leaves, colored by the early frost. Take a spray of these to study in water colors or chalks. Pin them up against a *simple* background, not too dark at first. If you make several, try one with a dark background. Notice color, proportions, character of the principal shapes and be careful to place agreeably on the paper.

Use a full brush of color. Remember that watercolor is always a trifle paler when dry, so put on your color rich.

Make a number of studies during the month of any autumn leaves you may be able to procure—oak, maple, sumac, woodbine, etc.

Also make a careful outline drawing of some individual leaves, of acorns and of maple seed pods for future use in design.

Make careful color notes of these leaves. See how many colors you can find in each leaf and



Reproducing the leaves

put down a little narrow strip of each. From these you will be able to make a color harmony for a design.

Chapter XI.

NOVEMBER

How many of our readers are familiar with the story of the Pilgrim Fathers? How they came over in the ship "Mayflower," in 1620, built log cabins and churches, suffered from cold and hardship through that first dreary winter, fought the Indians, who were then living all over this country—all for the sake of having freedom to worship God as they thought was right? If you do not know much about it all, ask your parents to get and read the story to you.

For your lesson in paper cutting, make a picture that will illustrate the first Thanksgiving of the Puritans. Let us find out all we can in connection with Thanksgiving and make our work for this month center around that holiday. The Pilgrims, with their somber black or grey clothes, white collars and cuffs, the small, simple churches which they built, and the Indians, who



The Pilgrims on a Sunday Morning
Design for Cutting Out

lived in tents in the woods and carried bows and arrows. When the Pilgrims went to church on Sunday, they were obliged to carry guns to protect themselves from the Indians. Think of the things they may have had to eat that first Thanksgiving, turkeys, pumpkins, cranberries, many of the same things that we have now. Try to draw some turkeys, some pumpkins, some cranberries, or cut them out of paper. They will be pretty to use for a design which you will learn about a little later.

We will begin by cutting out a picture of the Pilgrims. You may have them going to church with their families, or just the men going hunting, perhaps to shoot turkeys for their Thanksgiving dinner.

Use grey paper for the background or sky, white for the snow on the ground, and black for the church and trees and the figures. White paper can also be used for the collars and cuffs. Do not copy the one given here, but make others as you think they would look. Make some cuttings every day of the whole picture and of the separate parts—the Indian with his bow and arrow, the Pilgrims with large cloaks and capes,

and their broad-brimmed hats, the women with white caps fitting closely over their ears,

the little houses that they built of logs, and their churches and other surroundings. Cut them or draw them over and over until you can make them easily and well.

Now, let us make an invitation to send to grandma or to some relative for Thanksgiving dinner. We will use the drawings of a pumpkin, cranberries or turkeys, and make a pretty design.

* * *

Materials—A piece of wrapping paper 9x12 inches; a piece of white or light paper 8x11 inches; a piece of dark paper; scissors; paste.

Take the wrapping paper and fold it once to make a booklet. Be sure that all the edges are perfectly straight. Then fold the light or white paper inside of this. Your invitation can be printed on this. Now turn to the outside and on the front page you can make a design cut out of the dark paper. A row of little turkeys across the top would be pretty. Be careful to make them all alike and in an even row, not too close together. The cranberries or pumpkins could be made into a nice little border to go all around. Round red spots for the cranberries, with little black spots above and below, between the red, would make an attractive border, or the pumpkins between two black lines. Try them, and print "Thanksgiving" on this outside page.



The Thanksgiving Turkey

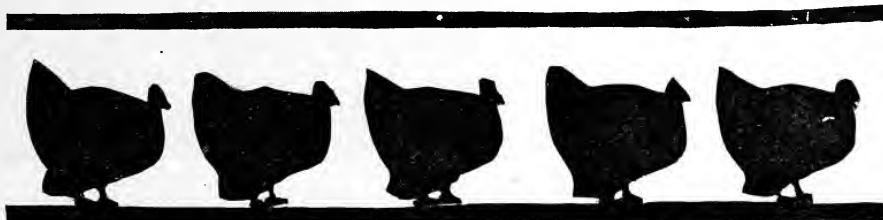
What we call "story-telling" for the little folks is called "composition" for the more grown up. A Thanksgiving composition, then, is an illustration or picture story which tells about Thanksgiving. Your picture may represent anything that you wish to show, either about Thanksgiving in its early history or as it is celebrated now. A good way to choose your subject would be to relate it to your school work. Perhaps you are required to write a Thanksgiving story. If so, let this be the illustration of it. If you are studying history you might take your subject from the Pilgrims, as they landed, or in their primitive homes in those early days. Do you know the story of Priscilla and John Alden? You might try an incident from that story. Read "Standish of Standish."

Use charcoal or a soft pencil and a soft rubber. Put a tone of gray over the entire paper; then draw with a dark tone of the charcoal or pencil and use the eraser to draw the light parts. Try to make your picture with three tones—white, light and dark gray. When you want to tell a story on paper be careful not to tell too much, nor to scatter your interest. Make up your mind what you wish to bring out in your picture and make that your point of interest, keeping all other parts of your picture subordinate to that. On the blackboard of your Chautauqua Industrial Art Desk make several sketches before you try on paper, just to arrange your figures and see which you like best. Make a line around a certain space and place your picture within this.

Cultivate and encourage your imagination by trying to create the pictures that come to your mind.

Cultivate the hand and eye by drawing things you see about you. If you are more interested in design than in making pictures, take the subject, "Thanksgiving," and make a design that will be suitable as a decoration for A Dinner Invitation, A Menu Card, A Place Card.

A poor production which is *original* does you more good than copying some other person's work, for it makes you think and the more you use your mind, the keener that mind becomes. Development comes from activity.



Turkey Border for the Paper Cutters

Chapter XII.

DECEMBER.

'Some Suggestions for Christmas Cards

Materials—A piece of red paper, not shiny; scissors and paste; common white paper; color or gilt for lettering.

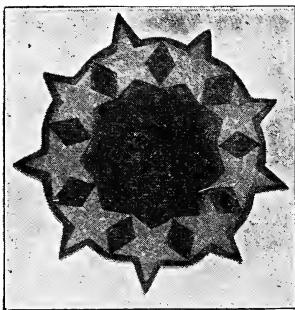
A Bell—First take some common paper, cut a piece four inches square, double it and cut one side of a bell, with a ring to hang it by at the top and a tapper just showing at the bottom. Open and see if it is a good shape, if not, try another and keep on trying until you cut one that is pretty. By cutting with the paper folded you will get both sides exactly alike, but you would not like the fold to show in the good paper, so when you have cut one that really pleases you, use it for a pattern and mark neatly around it and cut out three bells, two of red paper and one inside of white. Use great care and a very small pair of scissors.



to make the hole in the ring. On the outside bell print very neatly "A Merrie Christmas," or any greeting you wish, on the middle white one, print or write from (your name) to (the other name) the person you wish to send or give it to.

A Star Card

This can be made in paper cutting. You will remember the lesson about making valentines, when hearts or flowers were used as units of design. Now let us use stars. Cut a piece of paper of some soft color the size, square, that you would like your card to be, either single or folded double like a little book. Then take paper of another color and cut out many little five-point stars. Practice on these until you get a good one and then use it for a pattern, so as to have them all alike. Arrange these in a design, trying various ways, using six stars, nine stars, in fact, any number. Try a border of them, a group of them in one corner, or in the center. You really will be able to make many cards all different with the same motive. This can also be done with little bells, or little Christmas trees. Always leave space some-



where for the greeting, and print this on just as neatly as possible. It is always well to practice on the blackboard of your Chautauqua Art Desk before making your finished work.

Chinese Lantern for the Christmas Tree

Materials—Ruler and pencil; scissors and paste; paper, bright colored, 4 inches square.

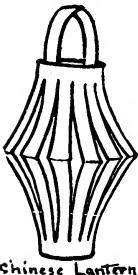
Lay the square of paper in front of you on the table and fold the near edge to meet the far edge. Crease it. Make a faint line with your ruler and pencil one-half inch from the top edge. Mark dots one-half inch apart on this line and one-half inch apart on the center creases. Cut from center dots to dots near edge. Open and paste the last strips together, then paste on a strip of paper for a handle and you have a little Chinese lantern, such as the children of China carry at their fetes, usually of very gay colors and very much larger than this. Several of these in bright colors will look pretty on the Christmas tree.

In Norway and Sweden there is no greater holiday observed than Christmas. During the summer there is so much hard work in the fields for women and children as well as for men that there is little time for holidays. But when cold weather comes and the days are short they begin to look forward to the Christmas festivities. They call it the "Tretten jule dage," or "thirteen days of Yule."

Before Christmas, for weeks, the women are busy with extra sewing, weaving and house cleaning, for the home must be in perfect order for the holidays. The larders are well stocked, not only the people, but the animals, horses, cattle, sheep and goats must have a special feast on the twenty-fourth of December.

Children buy small bunches of oats for the birds. The saying is, "A man must be very poor indeed if he cannot spare a farthing to feed the birds at Christmas."

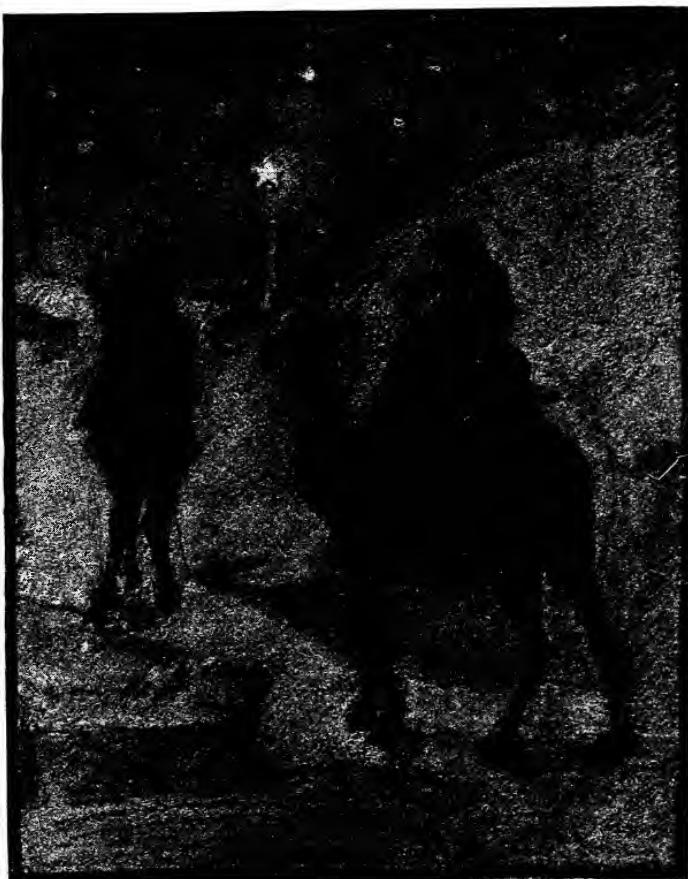
On Christmas eve all who are able attend service, coming home late at night. Many who live in the country carry torches, which is an old custom. (Think how picturesque this would be.)



They have Christmas trees, of course. It is from these north countries that we learned to associate the evergreen tree loaded with gifts and candles with Christmas. After their dinner, all take hands and form a circle around the lighted tree, dancing forward and back, singing a Christmas song.

For thirteen days the festivities last, much as our vacation time here. People visit each other, going about in sleighs and "skees" (a sort of snow shoe for north countries), for they have deep snow all winter long. There are church festivals, home merry-makings and gay sleigh rides.

We tell you this that you may form in your minds some pictures perhaps different from



A Study In Crayon

what you see right about you. Read it over again and then pick out some part and see if you can form a picture with your eyes closed. If so, try to draw it:

The people busy cleaning; feeding the animals; and children feeding the birds in the snow.

Remember that there are many mountains in these north countries. Use them in your distant background.

Procession with torches coming from church; the family at Christmas dinner; the Christmas tree surrounded by the family circle, old and young.

Design and Construction

How to Make a Portfolio

Material—Two pieces of cardboard, 8x11 inches; cloth for cover, 13x18½ inches; cloth for hinge, 13x2½ inches; two pieces of tape, 8 inches long; water colors or ink; brush pencil, ruler and paste.

Almost any kind of cloth will do. The nearer it is like book linen the better. Flour and water may be used for the pasting, but it is not so good as library paste. The cardboard should be rather thick and strong. The cloth and lining paper should be the best color you can get, not too bright, and should look well together. Do not use very dark cloth or the printing will not show well. Join the two pieces of cardboard like a book, using the narrow piece of cloth for a hinge. Keep the cards at least one-half an inch apart so that the portfolio will hold a good deal.

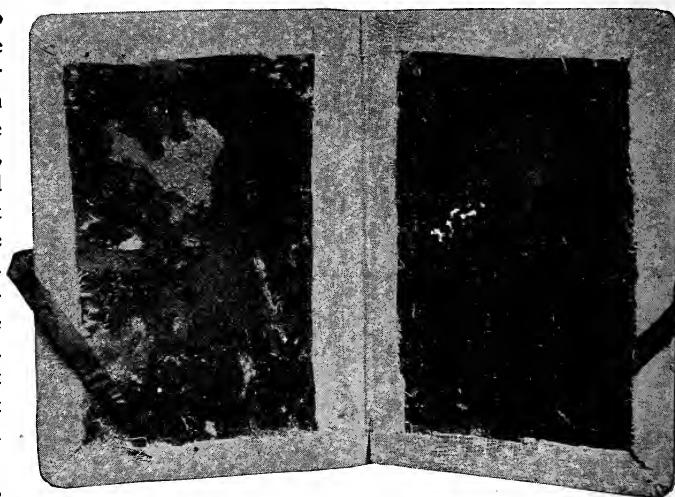
Lay the cloth down, smoothing it out perfectly.

Put paste on the outside of the cardboards and lay them down on the cloth, pressing it carefully. Be sure you lay it perfectly straight. Do not use too much paste or it will soak through. You might practice with a scrap of the goods to see how much paste is needed.

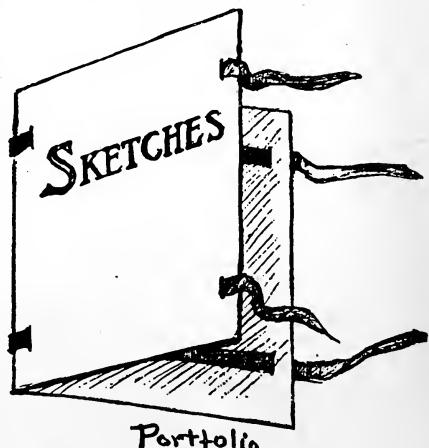
The cloth should extend an inch on each side and end of the cardboard. This is to be turned back over the cardboard. Cut off the corners so that when turned back they will meet. If you will round the corners of your cardboard, you will find it easier to fix the corners without any frayed edge showing. Put paste on the inside edge of the cardboard and turn back the edge of the cloth, pressing it down firmly. Make slits and put in tapes half an inch from the edge, pasting them down on the under side, as shown in the portfolio illustrated. This is left unfinished that you may see the construction of the corner and tape.

The next step is to see that the lining paper just fits, put paste on it and lay it on, rubbing it smooth. Use your ruler carefully for all the measurements, or your portfolio will not be a success.

You will now want to learn something about lettering before printing on your cover. Study the



Portfolio for Designs



form of the letters given here by copying them carefully, first on your blackboard, then on paper so as to become familiar with them and get quite a little practice. Then you will be able to do them nicely on your cover. First make guide lines with your ruler one inch apart, for the top and bottom of your letters. Make a number of vertical lines to help you keep the letters straight.

Take your portfolio, which is all finished but the lettering, and measuring a half inch from the edge, rule the double border line in pencil. Also rule the guide lines from the top and bottom of the letters. Draw your letters very lightly first in pencil, then make them carefully and definitely. Color the border line and letters with some deep color which looks well with the color of the cloth.

If you are not satisfied with the one you have made, you surely have learned something, and can make a better one as a gift to someone, if you will take time for it. Use this portfolio to keep your designs in, for you may find future use for them.

To Make and Decorate a Booklet

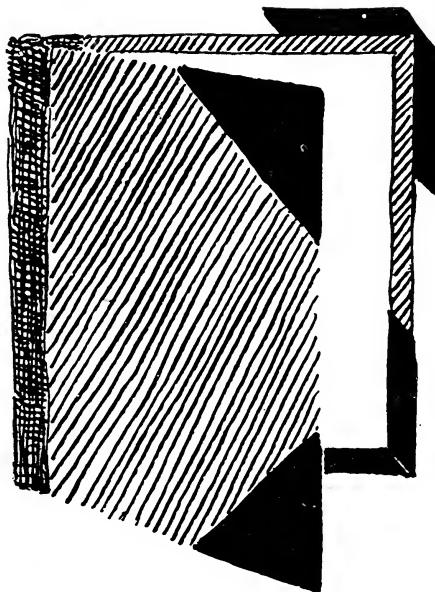
Materials—Six or eight sheets of good paper, 8x10 inches or larger; a rather large needle; strong linen thread.

Be sure that the pages are evenly cut so your booklet will look neat when it is finished. Fold all the papers exactly in the middle, keeping them all together. Thread your needle, then double your thread and make a good sized knot. Study the picture, so you will see how the thread goes.

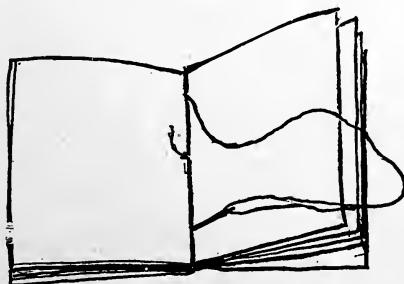
Now, open your pages, and sew the leaves together by putting your needle through the middle of the crease you have made in your paper. Sew down (from the inside to outside). Sew up (from the outside to the inside) about two inches from the upper edge of the book. Sew down (from inside to outside) about two inches from the lower edge of the book (see Fig. A), then up in the center, to the place where you started.

Pull the knot back a little and tie the two ends carefully over the long thread (see Fig. B). Cut the ends of the thread, leaving about half an inch.

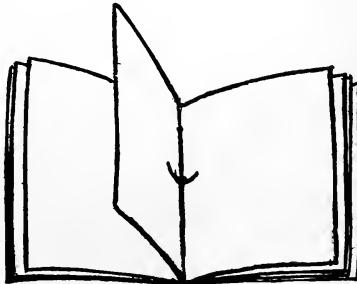
This is the proper way to sew small booklets.



To show the Construction of the Corners and Hinge



A

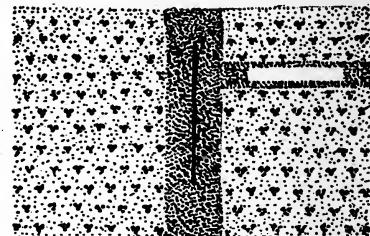


B

If you should wish to make your cover of different paper, you may do so, but it should not be very stiff paper or it will crack in the folds.

To Decorate the Cover.

There are many ways that designs may be used to decorate a cover. We have had so many border lessons that you will not need to be told how well you might use a border design. This time we will take up an all-over pattern. Do you know what an all-over pattern is? The word explains itself, does it not? Look about in your home at wall paper, carpets, linoleum, dress goods, and curtains. It is a design that repeats itself in given spaces over a large surface. Very often these spaces are squares or diamonds. That is, in fact, the way they are made. See if you can discover this in designs about you.



C

Before you begin to make a design for this book cover decide what you will use the book for, then make a design that will be appropriate. Why not make a collection of flowers and leaves? Find as many different varieties as you can, and after pressing them between newspapers under a weight, paste them down carefully in this book. In this case, it would be nice to make a flower or leaf design for the cover.

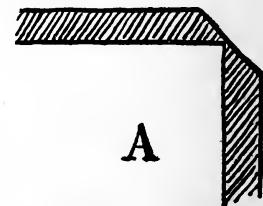
Choose your flower and practice on blackboard and paper until you are quite familiar with the form, then draw some squares and try putting your flower into these. Try different ways—with the stem, without the stem, a side view and a front view, showing the very inside of the flower.

When you have quite decided as to your flower form for the unit you are ready for the all-over design.

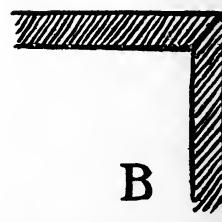
Take a sheet of paper the size of your book cover. Cut a piece of cardboard one-half inch square. Put this on the corner of your paper, and using it carefully for a measure, mark a dot, move it on and mark another dot, and so on until you have placed dots in squares all over your sheet. Now take your paints or crayons and place your flower in every square. Then take another sheet, mark it off as you did before with dots, and place your flower form *on* every dot, making the dot the center of the form. Then take a third sheet, and fill every other space, skipping the opposite space in the second line. This will make a diagonal pattern. Choose the design you like best and place it on the cover of your booklet.

You will readily see that any good, simple shape, carefully carried out, can be made into a very pleasing all-over design.

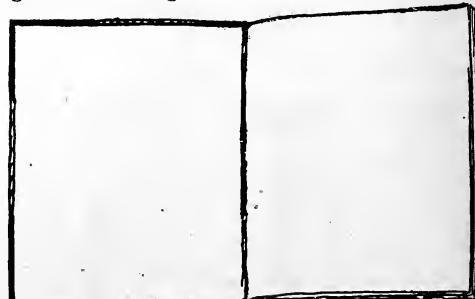
Before you decorate your book cover, in order to make it look as much like a book as possible, put a band of dark color down the back to suggest strength at the hinge (see Fig. C, at top of page). Then decide whether you wish to place the title on the outside. If so, make two firm lines and print between. In the space left, mark off your squares and proceed with your design.



A



B



C

Book Binding Explained

In these two lessons in book binding, the problem is to make a book for mounting a collection of pictures or clippings. It is a

problem that does not require any of the expensive adjuncts of a bindery, such as a press, or special tools.

The materials are:

Cardboard—Two pieces the size you wish your book to be.

Cover paper such as may be bought at a paper house or a book-binding establishment, two pieces, one-half inch wider and one inch longer than your cardboards.

Corner paper—A strip of leatherette paper, four inches wide and two feet long.

Binding Cloth—A piece of cotton cloth four inches wide and two inches longer than your cardboards.

Paste, paste brush, ruler, scissors, pencil.

In selecting your paper, choose a cover paper of some heavy weight in a soft color. The corners may be of book linen instead of leatherette paper, in a contrasting or harmonious color to that of the cover paper.

Have all four materials at hand before you begin to work. Let us consider, for convenience, that the cardboards are 7x9 inches. Cut your cover papers $7\frac{1}{2} \times 10$ inches. Now cover one side of cardboards with paste and lay on this the cover paper so that there is one-half inch margin at the two ends and one side; rub gently and evenly all over.

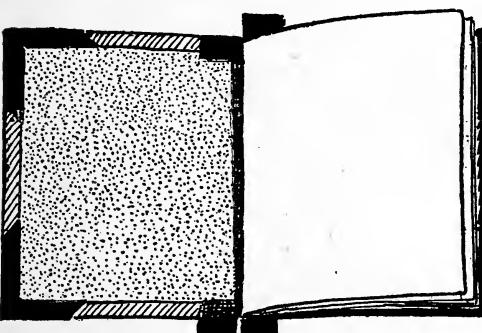
Then turn cardboard side up; cut off the corners diagonally (see A), *not too close*, and paste margins back over the cardboard, being careful that the corners are tight, and do not allow board to show (see B).

When the two cardboards are covered, hinge them together by pasting on the strip of binding cloth, leaving space of half an inch between covers (see C). Turn ends over and paste down on the inside. For the corners, cut two four-inch squares of leatherette paper. Divide these diagonally, making four corner pieces. Paste over neatly and carefully. Put book under heavy weight to press.

See that the papers for the leaves are all even at the edge. Crease in the middle and

lay within the cover ready to sew, following the directions on opposite page for sewing booklet.

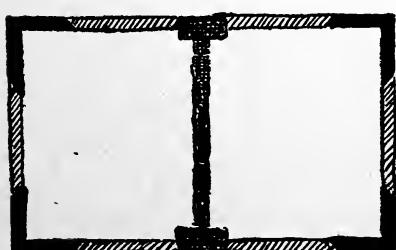
When the pages are sewed in and the ends of thread neatly tied, close the book, ready to put on the hinge binding. Crease



A



B



C

the strip of leather paper faintly down the middle. Lay on the table and apply paste evenly over the inside of this strip. Place the hinge of the book over the center of this paper and paste the leatherette over the back, covering the cloth that formed the hinge.

Notice Fig. A to see how the ends of this paper are slit in two, half to be turned up on the inside of each cover of the book and pasted neatly. When these four are pasted, the book is ready for the lining page.

To do this, put the paste on the inside cover evenly and close the book, pressing the cover down firmly onto the pages. This is important! Put paste on the cover boards (not on the page) and *shut the book*. If you leave the book open and paste down the page it will be sure to wrinkle.

* * *

Arranging a Still-Life Study

Always consider the character of the things you use together.

Flowers are pretty in simple vases or jugs. Fruit can be used with bowls, jars or baskets.

Do not combine kitchen utensils and parlor ornaments. Do not put vegetables and books together.

Make your groups simple. Two objects can be arranged in a very interesting way so as to make a really pleasing picture.

Consider the harmony of color. Consider the harmony of shape. Consider the light and shade.

You can learn a great deal by experimenting. Get in the habit of noticing beautiful things wherever you see them and try to discover what makes the beauty which you notice and admire.

In arranging your study, do not put together two tall objects, nor one very tall and the other very low. There must be some variety and yet not so much difference that there is no harmony or relation between them.

There must be "unity" or oneness. Although there may be two or more parts to your study, they should be so united that one's first impression will be of the whole, not of each part.

There should not be a gap between the objects. If there is space between, it must be connected by shadow; but the safest way will be to place your objects close together, perhaps one a little farther forward than the other, or one a trifle behind the other. When you are satisfied with the placing of your group, decide how you will best place it on your paper.

Make a finder by cutting an oblong shape out of a piece of paper about 2x3 inches, hold this up to your study, try it oblong, then upright, move it up and down, forward and back, until your group looks just right in this little frame, just as you should like to have it on your paper. Then study it quite a while, so that you can close your eyes and see the picture clearly. Now make a margin line on your paper about an inch or a half-inch from the edge, and try to draw the study as it looked to you through your finder. Draw in the masses of shadow directly, leave the light of your paper for the parts that are really light.

Finder A light object in shadow must naturally have some tone. A dark object in the light is never white, it may have white spots if the surface is shiny; this we call high light.

Study the edges carefully. If they are lost in the shadow, allow this in your drawing also. Notice three things carefully:

Placing on the paper; values, or how dark and light things are; shape and proportion.

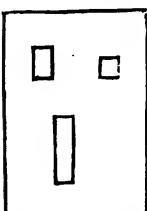
Spattered Design

Materials—Ink and a saucer; old tooth-brush; transparent tracing paper; knife.

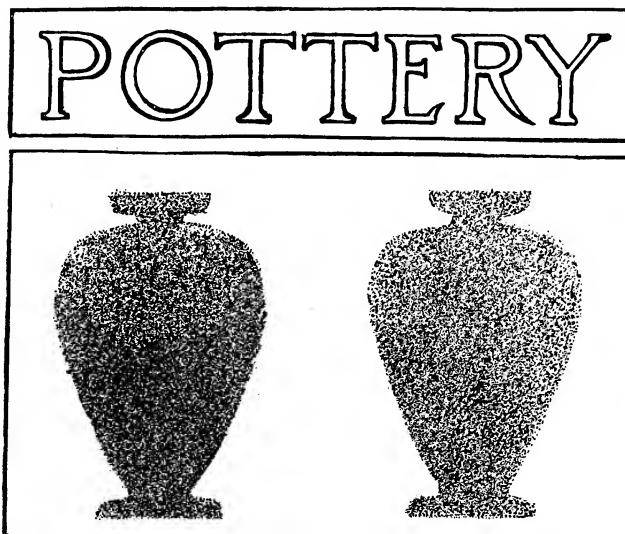
Taking for granted that your still-life study has been one that included a vase of some sort, we will now take that vase all by itself and make a careful outline of it, so that we may use it as a "unit" for a design. The vase should be simple in line.

Do not copy the one on the next page. Draw from one that you have in your home.

Before making your design, decide what you wish to use it for. A vase design could be used as a border on a book cover or portfolio. A border around a table cover or on the ends of a table scarf. When you know for what purpose you will use your design, you can judge what size your drawing must be.



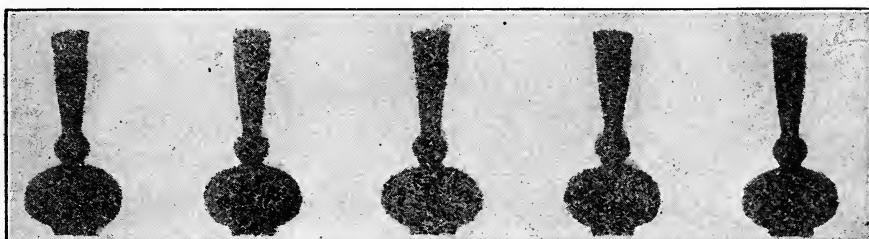
Do considerable practicing so as to get good lines. When you are satisfied that you have a good drawing of the right size in a clear outline, trace it on a large sheet of tracing



paper, then cut it out neatly by laying it on a board and using a sharp pen knife. Now pin this very carefully on your paper or cloth, placing the vase opening where you wish it.

Dip the tooth-brush in the ink. Take the point of your knife and pass it over the bristles of the brush making the ink spatter over the paper. Let it dry; then lift up the tracing paper and you will find the shape of your vase in a grey stipple with a clear-cut edge.

Move your opening to the place where you wish the next form, and pin again. Be sure



Awarded Prize on Design of Spatter Work. By Amelia Weidner, Age 15.

of your placing. You can see through the tracing paper, so be very careful to have them exactly on a straight line.

Spatter again. Continue to replace until your design is finished.

The effect is something like stenciling.

Modeling in Clay

Some of you may wish to model in clay; good. All the beautiful marble and bronze statues that we see in museums, and in the parks of large cities are first modeled in clay. So if you are interested in this, get some clay, or plastina and try to form all kinds of things out of it. Try making a picture in clay of some patriotic incident. A couple of men firing a cannon would make a good group, or a general on horseback. Do not be afraid to try

anything that comes to your mind. It is by doing that we learn. For modeling you will need:

Clay, in good soft condition; a board to model on, about one foot square; tools—your fingers and a pointed stick or pencil.

Wear a large apron and roll your sleeves out of the way.

Plastina may be used instead of clay. It is not so good to model with, but is cleaner and not so sticky to handle. It never dries out, so can be used over and over. Clay must be kept moist, or you cannot shape it.

Put the clay on the board all over the surface about half an inch thick. Now think of what you are going to model, and with the rest of your clay put on the general shape of what you are going to make.

This will look big and clumsy, just like the rough block of stone or marble out of which



Horses Modeled in Clay

the sculptor carves. Use your fingers, dig out here, and add there, until it begins to suggest the picture in your mind. If it is a group of several men and a gun, think of the proportions. How large is the gun in relation to the men? What are the men doing? Do they stand straight or lean forward? Find out from your brothers or father, if you do not know, just how a gun is fired. Remember that you want to make a *group*, not separate figures.

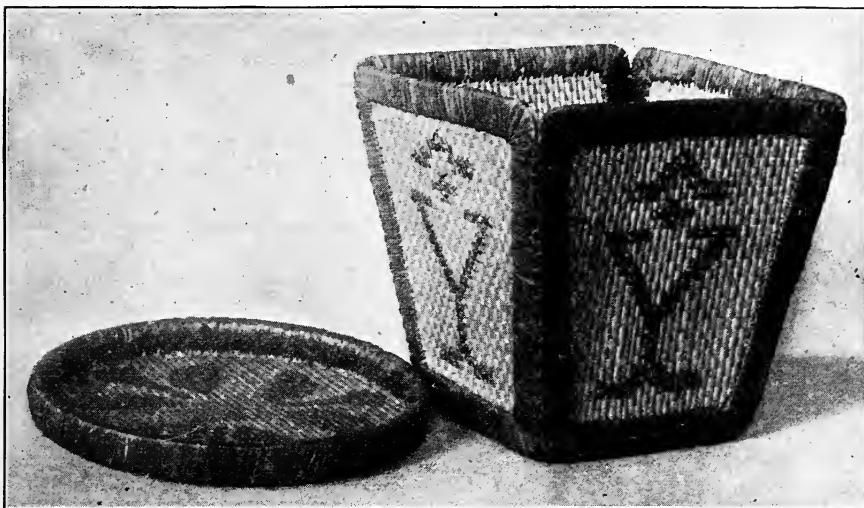
It must hold together and look well from all sides.

When you are modeling the men, do not make the legs too short, or the arms too long, or the head too large. Notice all these things carefully. A man with a large head and short legs will look like a child.

To Make and Decorate a Circular Tray of Tilo Matting

Materials—Tilo matting (can be had at any kindergarten supply house). Two embroidery hoops; raffia; a large needle; dyes and brush for staining design.

The tilo matting is a woven Japanese material, thick and serviceable, but pliable, almost like cloth. Place a piece between your two hoops, as you would put a piece of linen for em-



Circular Tray and Basket

broidery. Cut off all that extends beyond the hoops. This gives you a little tray with the hoops for the edge.

Take several strands of raffia. Moisten slightly, smooth them out and allow them to dry.

Use this like threads in your large needle to overcast the hoops. You will need to contrive the ends carefully to avoid knots. In starting do not pull the raffia to the end, leave two or three inches, holding this in place until you have covered it, pulling firmly at each stitch. The stitches should be close enough together to completely cover the hoop.

At the end dispose of the last piece of raffia under the last stitches, going back far enough to be sure of its not ripping.

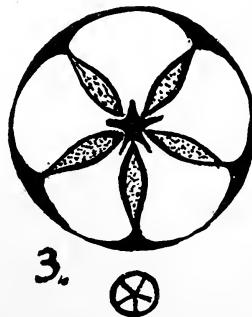
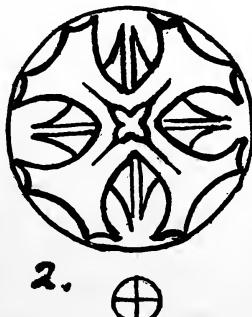
Design for Tray

The construction of this work calls for more careful planning of the design.

As has been suggested before, you can learn many facts about design from Nature's forms.

Some of the principles of design are: Balance, rhythm and harmony.

In this lesson we will talk about *balance*.



Circle Designs for Tray

The most common form of balance in conventional design is *symmetry*, which means "a likeness."

The circle designs here show three kinds of symmetry:

1. Symmetry on a vertical axis. What forms in nature show this kind of symmetry? Leaves and butterflies. See how many others you can find and make drawings of them.

2. Symmetry on both vertical and horizontal axes, making four quarters alike. Search Nature for flowers, etc., in which this is true.

3. Symmetry of radiation. This may be in three, five or seven parts. Find various flowers, seed pods, etc., in which this is true. Cut an apple crosswise in two and study carefully.

Now make a design of some of your own sketches in one of these forms for your tray. Do not make it too complicated. A simple design always looks well.

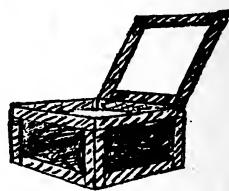
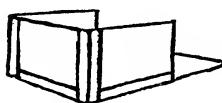
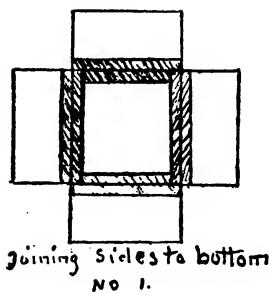
The tray in the illustration has stained design. The basket has the design stitched on with raffia, cross stitch.

* * *

Making a Paper Box

Materials—For top and bottom, two pieces cardboard four inches square; for sides, four pieces cardboard 2x4 inches.. *Passe partout* paper for binding.

If you can get colored and rather dull cardboard, it will be very pretty. Be very accurate as to the measurements so as to have the pieces fit each other nicely. Try to have your *passe partout* paper in a color which will look well with the cardboard. Cut four strips of



the *passe partout* paper two inches long, nine strips four inches long, and one strip sixteen inches long. Arrange the bottom and sides of the box flat on the table, as in No. 1 of the illustration. Fold all the strips of *passe partout* paper down the middle lengthwise. Moisten one four-inch piece and paste on where it will join a side to the bottom. (See No. 2 in illustration.) Use another piece for the side across from it. Join the two remaining sides in the same way. Then turn the sides up in the position they should be to make a box (one at a time) and join together with your two-inch pieces of *passe partout*. Use the long strips to finish the edge at the top, turning half on the outside and half on the inside. Finish the edge of the cover in the same way with four four-inch pieces of *passe partout*. Use the last four-inch piece for a hinge to join the cover to the box on the outside, and your box will be finished. (See No. 3 illustration). If your pasteboard is good, this will make quite a strong box, and could be used for handkerchiefs.

* * *

A Lesson in Wood Cutting

A Simple Cut Design for the Top of a Box

Materials—Pencil and ruler, a Sloyd knife (See Fig. A), basswood three-eighths inch thick and the desired size for the top of box or for a bread board.

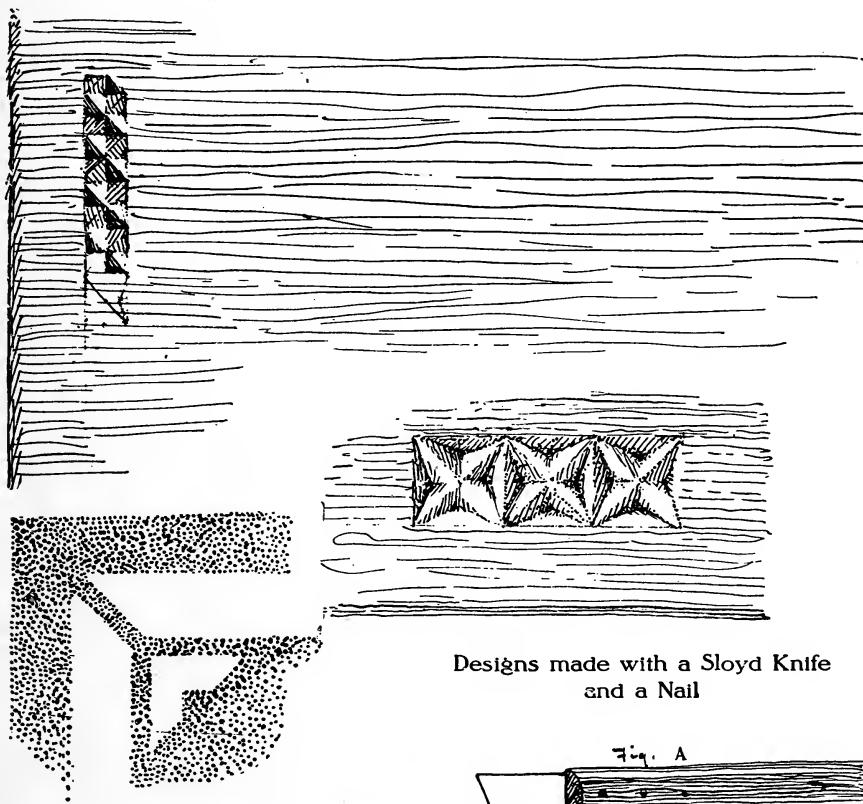
You may be able to procure a basswood box, but you will find that those in the market are all stamped with designs, and that they are usually bad, misapplied naturalistic sprays

or heads, badly reproduced and generally unsuited to the material, so sand paper the designs off with "0" or finer sandpaper.

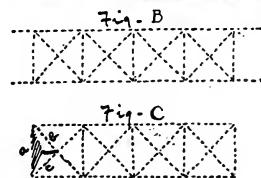
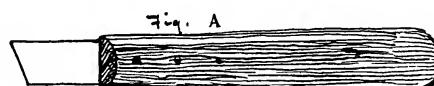
We plan to use a design which is adapted to the wood cutting. Try your knife on a sample piece of wood.

Rule lines half an inch apart and mark dots half an inch apart on these lines.

Join these dots diagonally both ways and up and down, which divides the surface into



Designs made with a Sloyd Knife
and a Nail



Sloyd Knife and Designs for Work

triangles. (See Fig. B.) Cut between them with three cuts so that the lines form the edges of a triangular-shaped valley. (See Fig. C.) To do this you must hold the knife firmly and cut down at a slant from side (a) down to center, from (b) down to center and from (c) down to center, three cuts to each valley.

Much depends on the sharpness of your knife and the firmness of your cut. Various designs can be made by using this motif of cross lines, as an all-over pattern or as a double border in various proportions.

The wood may be stained and polished.

Try some schemes on your blackboard or paper. It is well to draw your design very carefully before beginning to cut. Let the size of your border depend on the size of the surface to be decorated. See that the knife is sharp and keep it so.

The Kindergarten in the Home

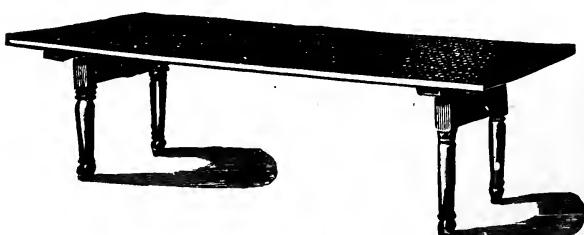


A kindergarten is a work and play garden for children. If you can imagine a beautiful vegetable or flower garden with fertile soil, well cultivated, warmed by the sun, moistened by rain and dew, weeds pulled up, the garden protected from wandering animals and the plants trained and protected from their peculiar enemies, you have the fundamental conditions of the kindergarten. This is the plan originated by Frederick Froebel three quarters of a century ago.

By the use of games, Froebel would exercise every part of the body, cultivate health, grace and energy. By learning how to use the hand and eye, he would teach the child to make useful things. By conscientious and persistent training of the interests in a variety of real, live activities, he would bring out creative self-expression.

Only a few children are within reach of the public or private kindergarten, but the kindergarten is within reach of every home. The best education that any child receives, the education that leaves behind the most fragrant memory, is the education which mother gives at home. Not only does this refer to those moral lessons which leave an indelible impression upon the mind, but also to the drawing out of the mental faculties themselves. Happy that mother who has had some training in kindergarten work, for it will enable her to do so much more for her children than she could possibly do otherwise. It is not necessary that an elaborate study of psychology should be made, but every mother should become thoroughly familiar with the psychology of the child and the principles of education advanced by Froebel.

One way is indicated in the Chautauqua Industrial Art Desk and the course of study which is outlined by Miss Vanderpoel in this booklet. No elaborate kindergarten supplies need be bought. A good plan is to get some of the simpler, inexpensive "gifts" as they are called. First, woolen balls, wooden balls, cubes and cylinders and large wooden cubes divided in various ways; then progress to surfaces or thin tablets of wood or pasteboard of various shapes; then to lines, straight and curved, shown by sticks of different lengths and metal rings, and end in points, which may be pebbles, shells or such seeds as beans, lentils, coffee berries, or corn. By taking these simple things in their order it is possible to give the child all the conception he needs for understanding the objects of the world about him. The child can learn much in his games with his toys. With blocks and beads he can be taught forms and colors as well as the beginning of number work. Mrs. E. E. Kellogg outlines a course of instruction which any mother with some study and a little care can undertake. She says, in *Good Health*:



Good Health:

"It is not difficult to have a little home kindergarten. The mother need not even give her whole time to the babies. Once started, they will play interestedly by themselves, but the mother should be at hand to change the games when it seems best, and to tuck in an occasional word of instruction or guidance.

"Make the children comfortable, first of all. Give them a low table and chairs which fit both the table and their own little legs. The Chautauqua Desk may be used as it is adjustable to the right height. And do not forget to have them play some games of motion when they have been sitting awhile.

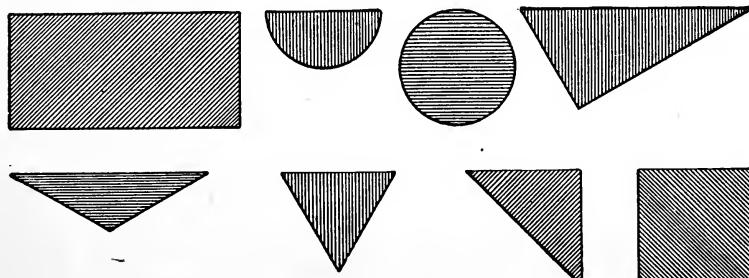
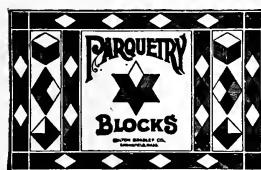
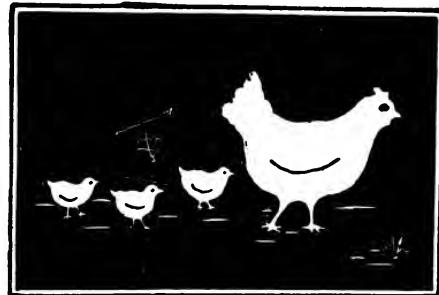
"There need be no set time for this kindergarten-at-home. My own rule is to encourage the children to play out of doors whenever it is pleasant and as long as they will stay out.

If they set themselves happily to playing dolls or steam cars, I do not interfere; but when they begin to get "fussy," or wonder what to do next, I suggest a "table game"—blocks, straws, sewing, cards, colors, clay-modeling, or the like. My eldest daughter—six years old—occasionally asks for pencil and paper and goes to figuring or writing, and while I have never given her a lesson in either writing or numbers without her asking for it, she has really taught herself the rudiments of both branches.

"And this brings me to another great principle of education: Thoroughly arouse a child's interest and he will educate himself along that line.

"Much can be taught children by means of stories. Late afternoon always seems to be the natural story hour, and a mother should try to take time for one little tale a day, at least. Choose it carefully, for its moral as well as its entertaining qualities.

"We have a little game we sometimes play at mealtime. The teeth are millstones which grind up the grain (the food) and send it down to the little miller who lives in the mill (the stomach). If it is not ground fine enough, he cannot make good flour of it, and little son will not grow big and strong like father. A three-year-old can play this game, and the other children can be taught the actual principles of mastication and digestion."



The Fine Art of Story-Telling

Being an Interview with Miss Edna Lyman

"Oh, mother, tell me a story."

It is a rare household, indeed, in which these words have not been spoken very often. What sort of an answer does the request receive? Does the tired mother evade the issue and send the child away to amuse himself, or is the craving of the imagination satisfied with a faltering reproduction of some nearly forgotten tale of the mother's own childhood? The universal temptation, if not the general practice, is to meet the situation in one of these ways. In only rare instances is the child's desire recognized as an opportunity for feeding and developing his imagination and establishing definite ideas with a truly interesting story, artistically told. To tell a story rightly is a fine art; educators are beginning to realize this, and there has arisen a certain company of men and women who make it their business to master this art and teach it to others. Among the first in this field is Miss Lyman, whose work has gained for her recognition in the foremost library and normal schools in the country.

Parents and teachers are both prone to forget that the education of the race began with story-telling. For centuries before there was the written word, men sat about the open fires and recited the traditions which had come down to them from their fathers. So literature developed, and history and geography and ethics were taught. The development of every child is a brief recapitulation of the development of the race, and it ought to start at least at the point where the race started—with the story, orally presented.

Old as is the art of the story-teller, in these days of the revival of interest in his art he is asked not only to tell his tales, but to train others in his art, that teachers and librarians and parents may add their efforts to his and so reach a larger number of eager children, but the home is the truly ideal atmosphere for story-telling. Every hearthside should be the gathering place of children, every mother the fairy queen, at whose behest fairies and giants and heroes of history are made to appear to charm the young imagination. The mother who "really has no time to tell stories" is to be pitied, and her plea of "no time" questioned in the majority of cases, even where she is breadwinner for the family. There are moments at least, if she is eager for companionship with the children, when she can plant the seeds of knowledge and ideals of strength and truth. Not to share the wonders of child literature with her boys and girls means the sacrifice of the most intimate and precious relationship, and it means turning her back on the fountain of perennial youth.

But to tell the story well requires preparation. The mother must first steep herself in the literature of children ere she make an attempt to unfold its beauties to the child. No hasty re-reading of the old tales is likely to bring satisfactory results; the offhand attempt to recall what was told in one's youth is sure to prove disappointing to both mother and child. There must be real interest on the part of the parent, and this can only be gained by a sympathetic study of the stories themselves. Selection is no small part of the work of the story-teller; to know the sources of the great stories and to choose those especially suited to different ages of children is a profession in itself. When the choice is made, many a story must be adapted for telling, amplified or condensed, as the case may be, without changing the original story, the creature of some author's mind. Such rich mines as Hiawatha, Idyls of the King, the Norse legends, Grimm's Fairy Tales, and the Arabian Nights will yield their treasures to the sympathetic explorer, and these will be found as rich and interesting as when first uncovered in the years of childhood. Certainly the Bible stories will not be omitted, and in most homes they will come at the top of the list. If one has any doubt about the proper method of instilling an interest in and love for the Bible into the minds of children, let him contrast the child whose mother drilled him in the catechism, with the youngster who sat with open eyes while mamma told him of Samson

who slew the Philistines, and how Moses, with God's help, brought destruction upon the Egyptians and led the children of Israel through the wilderness into a land of milk and honey. To link religion with strength and trust in God with the power to do great things, is an important achievement in the training of the child mind. Here are some suggestive sources for stories:

GENERAL.

Moulton—Old and New Testament Stories (Modern Readers' Bible).

Houghton—Telling Bible Stories.

Carnegie Library of Pittsburgh—Story-hour courses from the Greek myths, the Iliad and the Odyssey (five cents). List of good stories to tell children under twelve years (five cents).

Bryant—How to Tell Stories to Children.

KINDERGARTEN, FIRST AND SECOND GRADES.

Harrison—In Storyland.

Lindsay—Mother Stories.

Perrault—Fairy Tales, translated by Charles Welsh. Heath.

Scudder—Children's Book.

Dodge—New Baby World.

Mother Goose—Ed. by Charles Welsh. Heath.

Mother Goose—Ed. by Wheeler.

Mother Goose—Illus. by Mabel Chadburn.

Grimm—Household Tales, translated by Lucy Crane.

THIRD GRADE.

Scudder—Book of Legends.

Grimm—Selections.

Baldwin—Fifty Famous Stories.

Anderson—Fairy Tales, selections.

Andersen—William Tell (Told to the Children series).

Waterloo—Story of Ab.

Arabian Nights—Selections.

Kingsley—Greek Heroes.

FOURTH GRADE.

Brown—In the Days of Giants.

Bradish—Old Norse Stories.

McMurray—Pioneers of the Mississippi Valley.

Kipling—Jungle Books.

Greene—Legends of King Arthur.

Macgregor—Stories of King Arthur.

Pyle—Story of King Arthur and His Knights (best, but expensive).

FIFTH AND SIXTH GRADES.

Church—Odyssey for Boys and Girls.

Pyle—Merry Adventures of Robin Hood. (Selections from same in inexpensive form).

Macleod—Book of Ballad Stories.

Grierson—Children's Tales from Scottish Ballads.

McSpadden—Stories of Robin Hood.

Brooks—Story of Siegfried.

Chapin—Story of the Rhinegold.

Chapin—Wonder Tales from Wagner.

No one can give a story to another till it is his to give. He must live with it, till he feels the joy of it and the reality of it, as though it were an experience of his own. And hazy impressions, any uncertainty as to the sequence of incidents and running back to put in a forgotten portion, means a failure to paint the picture he has promised to place upon the

canvas. There must be a distinct appreciation in the mind of the story-teller of the value of each particular story, be it nonsense tale, fairy story, or Bible story, but moralizing—never.

Shall the child retell the stories? Many educators say, "Yes;" Miss Lyman is inclined to say, "No, except when the story is told with that definite purpose in mind. Then it is language or grammar work." "Let us not attempt to cumber the story and make it merely a vehicle for carrying facts," she says. "I do not like to hold the child up and drag out of him the story which he has been given. I plead for the story purely as a means of pleasure. Every good story will sink into the mind and produce its impression; but let us regard it simply as food for the growing imagination, and not in any sense an exercise in memory training. For the child to know that tomorrow he must rise and repeat what he is hearing, with frequent interruptions, as 'You forgot to mention this,' or 'That is not quite the way I told it'—that takes all the pleasure out of it. Story-telling simply as a pleasure more than justifies itself by its results.

"I have gone into school rooms filled with the children of unimaginative work-a-day people, and have been met by the teacher with a dejected warning that her pupils seem utterly lacking in imagination. The first stories before such classes are harder than day labor. There is no response. But as the attempt is repeated and new stories are told, one can see a face here and there break out with a gleam of interest. Ultimately almost the whole of that stolid, undemonstrative class will be won. Imagination will show forth where there was no imagination before; children to whom school work was the veriest drudgery, and on whom the appeal of the beautiful was utterly lost, experience a literal new birth. Such experiences confirm the belief that story-telling is well worth while for its own sake."

Nothing is more deplorable, according to Miss Lyman and her colleagues, than the total unfamiliarity with children's literature displayed by parents and teachers. What is the use of teaching the child to read, they ask, if he is not to be taught what to read? What purpose is there in giving him a key to the treasures of the world, if you do not go with him into the treasure house and point what is worth while and what is not? The first business of the teacher, and of the parent also, for that matter, is to get in touch with the local library and find out what books there are of a proper character for children's reading. The librarian ought to be on the consulting staff of a family as surely as the physician or the dentist.

Miss Lyman is for a return to first principles, for a training of the child through its interest and imagination. More and more the teachers are following where the story-teller points, and are finding that they work with more responsive classes. The parent who follows also, wandering with her child through the fields of mythology and fairyland, finds in the hours so spent the most fruitful experiences of parenthood.

The Development of Genius

Methods of Child-Training Which Every Parent Should Know

The first principle to keep clearly in mind from first to last is that of *encouragement*. This does not mean that you are to pet and spoil your child by overpraise. Never let him feel that you consider he has reached the top notch, even if he has won prizes and perhaps far out-distanced you along the particular line he is pursuing. The most disagreeable person in the world is the fruit of a spoiled child, who has been constantly told how wonderful his work is. But judicious praise has an effect on the mind which uplifts and prepares it for greater triumphs. The man who has built a fortune from the efforts of his employes is the man who has known how to praise and when to praise. So it is with the parent.

The great majority of boys and girls have only mediocre ability along any line. Yet they are plastic clay, which can be shaped and developed. Given even a mediocre ability, if the child will develop that along any one line it will not require many years for him to far outstrip his associates. It is *persistence* which triumphs in the end. Persistence is the second great element in success along Industrial Art or any other line. If you want your

child to be successful, help him to cultivate persistence. The natural child will start a task and as soon as the interest has worn off, he wants to begin something else. Perhaps it is a picture. He has the outline complete and the rest of the picture is clearly in his mind. Now encourage him to go ahead and complete it. Even if he spoils it and has to do the work all over again, the doing will cultivate one of the most essential qualities to future attainment. Perhaps he has started to make something. He gets part way and is interrupted to run an errand or play with other children. When he gets back he has lost his eagerness. Right here the parent can encourage him to go ahead and finish what he has begun. Many great men will tell you it was this faculty, which a wise mother and a wise father cultivated, that meant more to them than anything else in their later success.

Many parents are constantly complaining of their children to their faces and before others. They call them lazy, good-for-nothing, slow and stupid. In a fit of ill-temper they tell them they will never amount to anything anyway. This leads us to our third principle for developing genius and that is, *don't nag your children*. If you are nervous and fidgety, either send them off to work or play where they will not tempt you to say harsh things to them, or put yourself under the bit and bridle, for you can say nothing which will hinder their development more than to express the thought, "You are a good-for-nothing." That will cut deep, and will long be remembered against you. Like an initial cut in a young sapling, the growing years will only enlarge and deepen it. Too many boys and girls will seriously believe it and it will paralyze their ambition to really amount to anything.

We can trust the parent who really loves his children to provide the proper atmosphere for their development. If the child is slow in coming on, that is no evidence that he is stupid. At that very moment he may be struggling within himself to find himself. Give such a child the warm parental sunshine of love and he will surprise you in later years with his achievements. Some of the world's greatest geniuses were considered blockheads when they were children. By surrounding them with opportunities for self-improvement and by encouraging them to follow out their ideas of constantly creating and constructing useful and ornamental things, you will soon find that they are gaining that most useful faculty of all in a definition of genius, *individual initiative*.



"The Robin"

Photograph by Francis and Mary Allen,
Leefield, Mass.

"Sleepy Hollow" Waked Up

By Miss Matilda Vanderpoel

Some years ago a Chicago woman went back to spend a summer in her old home town of Deerfield, Mass., in the Berkshire Hills. She found the sleepy little town as she had left it many years before, quaint and charming, snuggled cosily under the magnificent old elm trees which were so large that the lowest branches overhung the roofs of the two-story houses. The old Colonial homes of gray weather-stained wood, exquisite in texture, were still in perfect condition. How enormous the chimneys seemed! It is said that when these homes were built the chimney was erected first and a house then built around it. Often four fireplaces on each floor were let into one. She enjoyed more than ever the doorways, so characteristic of old New England, with the side and fan lights, and the canopied doors with their brass knockers.

What a restful place this was! She fairly reveled in the beauty and quiet of it all; it was such a decided contrast to the great Western city, where her life was a very busy one.

As the weeks passed on, however, she began to realize

that the people, and especially the women, seemed sleepy and gray also, quite in harmony with their surroundings, very charming to meet and visit with, but entirely without occupation outside of the daily routine of their home duties. All the days were alike; weeks and months passed by without any change or any growth. It was stagnation; not only that, but they were poor. The homes were comfortable and there were the necessities of life, to be sure, but money was always scarce. A trip to Boston or New York, a new book or picture, in fact, any luxury that might vary the monotony of life was out of the question. So their lives were very narrow indeed.

Why could not these women do something in their spare time, of which they had at least several hours every day, something which might give joy to the outside world, with which they were scarcely in touch, and give them happy hours of beautiful work, as well as bring to them the much needed money? The thought came to her that there must be looms



At Deerfield, Mass.

and spinning wheels tucked away in the attics of these old homes which had been idle many years. People in the large cities were clamoring for home-spuns and ready to pay for them. Rugs, towels and hangings were in great demand. She suggested the idea to a group of women, who seemed rather pleased and willing to try. Looms were brought from the attics and fitted up, old patterns were found, and the weaving began. One thought led to another. Some of the older people remembered about the making of baskets; so this was taken up. Next came the weaving of rush bottom seats for chairs and old chairs were brought to light and re-seated. Then the blue embroidery was resurrected; old pieces were used as patterns and reproduced.

It need hardly be said that all these things found a very ready market; in fact, as the Deerfield industries became known throughout the country that little town was soon as busy as a beehive; everyone seemed to be occupied with something interesting. Even the men became interested and studied wood carving, and antique chests and pieces of old furniture were reproduced.

Two sisters who had been school teachers became interested in photography. They

found a rare field for their work, both out of doors and in, as our examples show. These photographs are really works of art. In light and shade, arrangement and workmanship, they are charming, and hold their own with the best artistic photography.

Today Deerfield is a most interesting place to visit, for, in spite of this change, the place is unspoiled. You will not find a store or stores where you can purchase the beautiful and useful things they make, but at various homes you will find headquarters of the different industries.

Deerfield is only one of many towns where old industries have been revived, or new ones established, and in many the principal workers are women who give a part or all of their time to this occupation. We find a great improvement in the handiwork of women in the last ten or fifteen years. Beautiful things are being made practical and practical things are made beautiful.

Child Activities

Flower Faces

By Edward S. Everett

In fairy stories, princes and princesses are so often and so easily changed into strange animals and things, that many a small person has laid down a fascinating volume with the vague fear that she might find herself a frog or a fairy.

Now, Marguerite is a very imaginative little lady. So it happened that I was not greatly surprised to see her reading a book, on the sky-blue cover of which formidable witches were broomsticking rapidly hither and thither to the great peril of a silver moon and a few twinkling stars. Finally she laid down the mystic volume with a sigh, and with an absent look in her dark eyes, said, "At the touch of the mystic wand the sunflower became 'Aunt Mary Wilbur.'"

This was rather a surprising statement, for Miss Mary Wilbur is a maiden lady much too commonplace to respond to a magic wand or any other mysterious thing. But as I thought the matter over I found there was much evidence behind Marguerite's statement. Her round face with its sunbonnet did strongly remind me of a sunflower. And so Miss Mary Wilbur, who was formerly only a respectable middle-aged woman whose kindly nature had made her "Aunt Mary" to the neighbors' children, has become to us a released victim of enchantment.

Now, Marguerite having discovered this new route to fairyland, proceeded to travel it unceasingly. The jolly farmer who drives in from the country with vegetables and



Flower Faces

fresh eggs was her next subject. She decided that his red whiskers and hair made him a member of the pink family. This was a great triumph. All her little friends received

new names. She hunted up a florists' catalogue, and the resulting names were the admiration and wonder of the youngsters. It was no unusual thing to see Cyclamen, Delphinium and Calycanthus Floridus engaged in earnest conversation. But these names quickly lost their popularity. They were too hard to remember, and very much too hard to say, and now Morning-glory, Daisy and Violet are the popular names.

When her big brother came back from college with a crop of curly, blonde football hair, she named him Chrysanthemum on the spot. And when he returned to college in the fall the nickname followed him.

Many of the names have been very apt. The little darky is greeted as Pansy, and the name fits him like a glove.

The Laughing Sunflower It seems to be an interesting game for the children. If you look about among your friends you will be surprised to find how many of them have flower faces. Try it and see.

Fun in Map Drawing

How can our teachers expect us to remember how to draw maps? They seem to think a boy's memory is endless. Each map bristles with peninsulas and capes, straits and sounds, mountains and rivers and all the other peculiarities with which continents are burdened. And the worst of it is that they leave nothing to our imagination. If they would permit us to improve the map a little, to straighten the crooked river or alter a clumsily constructed gulf, or put the lakes where they would furnish the best skating, that would be interesting. But, no! North and south rivers must not be drawn east and west—and the last time I put a mountain range just outside the coast line instead of inside I got into trouble.

But one day I saw a cartoon in which the outline of the country formed a face. The country was about to go to war, and the face had been drawn with a very angry expression. Of course, I was interested and observed carefully how it was done. Ever since, when I see that map, I think of the angry face in it. And ever since I have been looking for the faces in every map. So capes and gulfs are easily remembered because they form noses and mouths.

Here is a sample of what I have found. Uncle Sam is turning a smile on the older countries of Europe in No. 1. In No. 2 he is bestowing on Canada a look of friendship.



In No. 3 he shows to South America what may be called his Pan-American smile. In No. 4 he turns a sly and confident look towards the little fighting country, Japan, across the Pacific.



No. 3



No. 4

In each case I have drawn the outline of the United States to correspond to the features beside them, so you can see the smiles are really there.

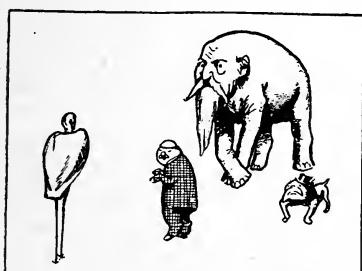
Every map has its face, and usually they are interesting. It is like making a new acquaintance to find old Johnny Bull himself staring out of the map of England, or the fierce little gentleman out of the map of France, or the kaiser in the map of Germany. Turn to your geographies and see if you can find them.

And when you have found them—for of course you will, there will be a group of friends in your geography instead of obstinate, meaningless lines. You will make a call upon John Chinaman or the Sultan of Turkey as willingly as upon a small playmate, and I think you will remember your map people as long as you live.

Fun in Drawing Animals

Drawing animals is fun. A boy or girl hasn't been through the whole of childhood unless he or she has spent some hours in drawing queer animals. Animals fascinate children. Did you ever know of a little girl who did not want to smooth the kitty's fur whenever she saw one. Did you ever know of a small boy who would not acquire pets, from stray dogs to stray mud-turtles? And children always draw pictures of what interests them.

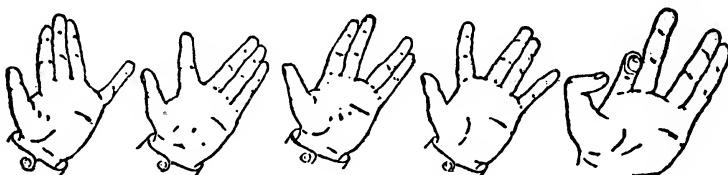
They begin to draw animals early. Peculiar dogs and horses are usually their earliest efforts. As they grow older many of them still find it a source of amusement, and sometimes profit. Boys and girls often want to be artists or cartoonists. Nothing is better for practice than animals. Many cartoonists have made a great success out of "bug people" and "dressed up" animals. Animals' heads on men's bodies and men's heads on animals' bodies are common in the comic column.



Another use to which animal drawing may be put is the ornamentation of cards. A butterfly is as big a design as can be made for the corner of a card. Menu cards with appropriate designs of birds or fishes or other objects are very attractive.

Catchy Tricks with the Fingers

Do you like to play tricks with the hands? Here are a few: Try parting the fingers as shown in the five accompanying figures, holding your hands in front of you. I think you will find some of these stunts not so easy to perform.



Try to turn one hand in a circle from you, while you turn the other hand in a circle toward you. Then sit down in a low chair and try to clap one of your knees continuously with one hand and at the same time keep rubbing the other knee with the other hand. Take hold of your left elbow with your right hand, saying that you can put the right where the left cannot touch it.

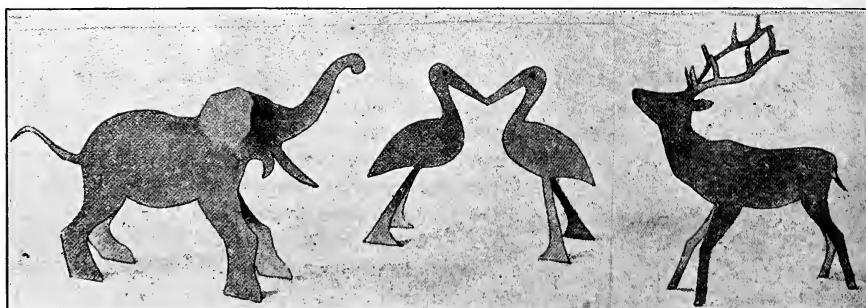
A Jumping Contest In the Animal Kingdom

Heavy brown or grey paper or pliable pasteboard as thick as that in postal cards is used for this interesting game. The contours of the animals are cut on a double fold, the two pieces being pasted together, excepting the limbs, which are stretched apart. Ink is used for painting the eyes when the material is smooth, and pencils for rough materials.

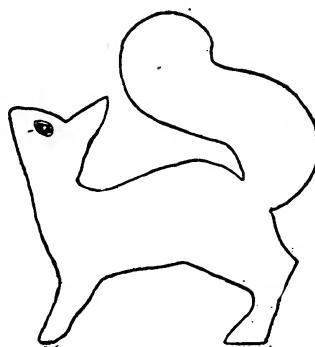
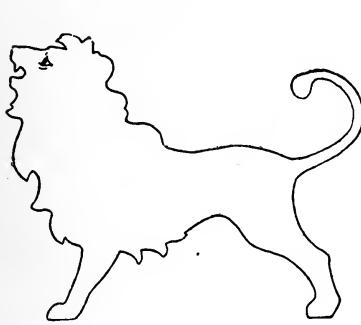
The lion's mane and other accessories are painted in the same way. The twin storks are unique on account of their being joined.

Several dozen figures are necessary if a game is to be played. A large pasteboard cover is used for a dancing floor. It must be perfectly smooth and not too stiff. A cork hammer, made of a medium-sized cork, with a pointed piece of wood about seven inches long, through the center, produces the motion. The leader of the game puts the names of the animals on slips of paper, folds these and lets each child take one. Now the animals are placed on the cover that serves as a dancing floor, in rows or in a circle.

The leader now takes her cork hammer and drums on the edge of the dancing floor in rhythmic beats. A prize is to be given to the child whose animal can remain on the floor



longest, without tumbling over. It will add greatly to the children's amusement if they are allowed to sing some lively martial air while the dancing is going on. An occasional collision is very exciting. It looks quite dangerous to see the elephant run into the lion, and to watch the little squirrel trying to get out of the way of the funny stork twins adds to the general merriment. The prize winner is always a favorite, for no member of this unique menagerie cares for the sweets that are appropriate prizes for a game of this kind.



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The Potato Zoo

The majority of children who live in a large city know wild animals from their frequent visits to the zoo, so they will be able to criticise the animal shapes mother so deftly cuts from an ordinary potato.



First the Potatoes Are Cut

Convalescent children can be made very happy by showing them how to make these wonderful animals, which they can house in cages and stalls constructed of wooden or stone blocks, and the little girls can make fine doll families and dress them as gorgeously as they please.

In selecting potatoes do not miss those peculiarly shaped ones that suggest the form of some animal. Cut thin strips of wood from cigar boxes, scour the potatoes thoroughly, and use wooden or porcelain animals as models, or cut a silhouette out of white paper. One, two or more potatoes, according to the size of the ani-



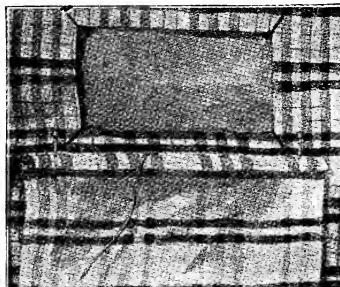
Then Joined with the Sticks



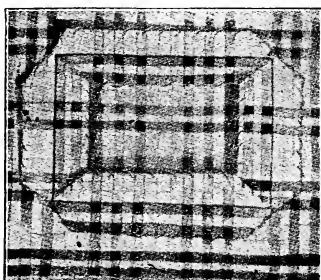
All Complete

mal, are "speared" first, then the wooden legs are shaped and attached. The neck and head must be characteristic of the animal. It takes some skill and practice to cut this, as well as the mouth, nose, and ears.

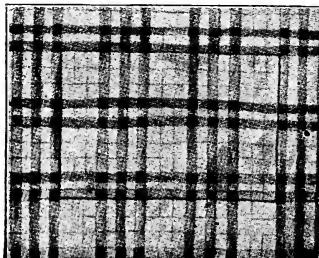
The pig is made of four strips of wood, one potato, two potato slices for ears, and a curled strip of paper for a tail. Birds require paper tails and wings, and horned animals have horns made of soft cardboard. The elephant's tail looks well made of braided strips of paper, which makes it pliable. An owl has delicately carved plumage. There is much opportunity for work with the brush in painting the faces. Dolls need a wig made of black wool, curled with a pair of scissors. Crimped paper of some bright color will do for the draped costume and the turban worn by the camel driver or the keeper of the zoo.



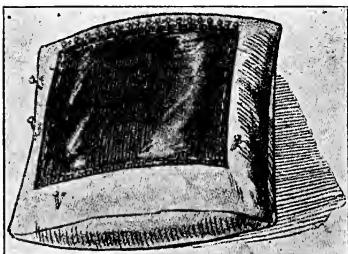
III. 1—Overcasting One Edge



III. 2—The Under Side



III. 3—The Upper Side Complete



III. 4—A Cushion Covered with Oil-Cloth to Sew On

A pet dog or cat will be a splendid object for reproduction. The perceptive faculties are exercised, the eye trained, and the sense of humor aroused by this unique and very interesting pastime.

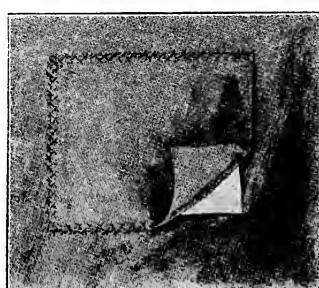
Artistic Darning And Mending

A Lesson for Girls

To insert a plain patch artistically, cut it out evenly, as shown in Ill. 1. Cut diagonal edges, leave about one-eighth inch for the seam, and sew with overcast stitches on the reverse side (Ills. 1, 2 and 3). When the material is striped, checked, or figured, the pattern must be carefully matched. To avoid heavy seams when mending flannels, do not turn any edges, but make the seams by working the rough edges first on one side and then on the other with a herring-bone stitch (Ill. 5). Always match the thread in color.

Where there are children, it is often necessary to mend uneven tears in soft woolen materials. These should always be darned on a cushion covered with oil-cloth (Ill. 4). Pin the torn part on the cushion wrong side up, and baste the edges with large stitches. Then darn back and forth with threads drawn from the cloth, always being careful to avoid drawing the material together.

When darning patches in striped materials, carefully matched threads drawn from the cloth are used. Diagonal stripes must always be darned in the stripes, and every patch must be carefully pressed, using a damp cloth.



III. 5—Mending Flannel

Home Chautauqua Handicraft

Practical and Profitable Ideas, By A. Neely Hall

Mr. Hall began writing a little over twelve years ago with the contribution of occasional articles on boy's work and amusement to magazines. There was an immediate demand for a book on handicraft for boys and girls, and, as a result, Mr. Hall published "The Boy Craftsman" in 1905. The success of the book speaks for itself. It has been introduced into a large number of grammar, high and manual schools in the United States and Canada. It is to be found in practically every public library of any size in this country, and already there is a demand in Australia for it, and it has been put into a special English edition in London.

In this book the drawings are profuse and excellent, and it is safe to say that there is no better work for the boy who wants to do practical constructive work on a small outlay.

Mr. Hall contributes occasional articles to the Ladies' Home Journal, Good House-keeping, The American Boy and other well known periodicals. Of late the calls upon his time for contributed articles and book work have made it necessary for him to give up a lucrative position with an architectural firm and devote his time exclusively to this larger public service. "The Boy Craftsman" will be sent prepaid upon receipt of \$2, and "Handicraft for Handy Boys" prepaid upon receipt of \$2.25. Powers, Myers and Co., Chautauqua Park, Valparaiso, Indiana.

Chapter I.

Fitting Up a Home Workshop

The making of things out of wood generally is conceded to be boy's work, and boys, as a rule, have a pretty poor opinion as to what their sisters can do with a hammer and saw, but many girls like most what boys like, preferring boys' books to those written especially for them and studying manual training as well as cooking and sewing, so the writer feels pretty sure that you girls will be interested in the work to be presented. And here is a good opportunity for you to surprise your brothers by showing them what you can do.

If you have a hatchet, hammer, cross-cut saw, chisel, smoothing-plane, bit and bitstock, screw-driver, jack-knife, oil-stone, rule and carpenter's square, you have enough tools to

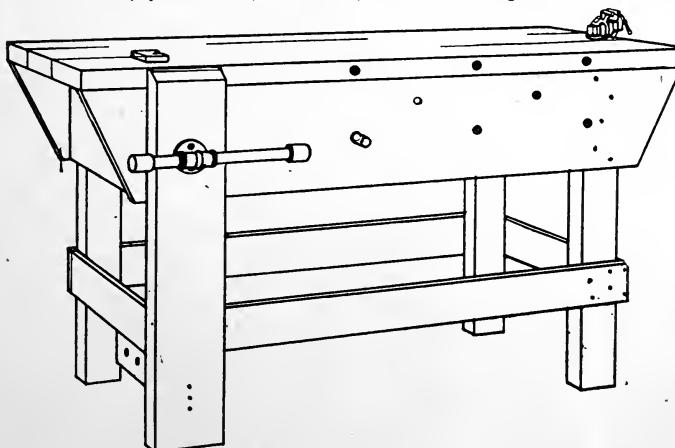


Fig. 1. The Work-Bench

start with, unless these tools be of the "toy" variety, which are perfectly useless to anyone who expects to turn out good work; and here let me caution you against buying the regular tool-chest outfits, as these tools are often of poor quality. It is much better to put the money which a chest of tools would cost into a few first-class tools and then increase your outfit as you r spending money

permits. A rip saw, bracket saw, jack-plane, four chisels from $\frac{1}{4}$ to 1 inch in width, half a dozen bits from $\frac{1}{4}$ to 1 inch in diameter, a gimlet bit, and screw-driver bit, brad-awl, nail set, file, pincers, rule, gauge and compass, are the principal tools you will find the need of as you advance with your work.

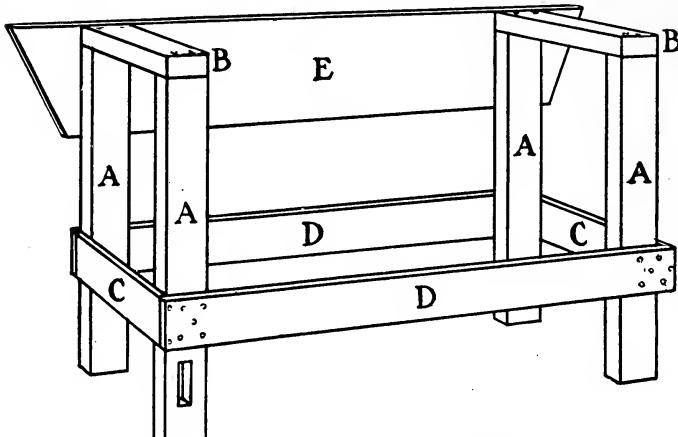


Fig. 2. The Framework of the Work-Bench

have a solidly-built work-bench for the shop, and I am going to show you first how to make one. If there is no lumber yard or mill near where you live, probably you can arrange to get all of your material through a carpenter.

Fig. 1 shows the completed bench and Fig. 2 its framework. Cut the four legs, A (Fig. 2), out of two-by-fours two feet four inches long, the top crosspieces, B, out of the same size stuff twenty-two inches long and the lower rails out of seven-eighths inch boards four inches wide, side rails, C, twenty-two inches long, and front and back rails, D, four feet long. Spike the crosspieces, B, to the tops of the legs, and rails, C, to the sides eight inches from the bottom; then stand the frames thus formed on end and connect them by means of rails, D. Cut the aprons, E (Figs. 2 and 3), out of ten-inch boards five feet long and nail them to the legs as shown, with the ends projecting the same distances, and procure three pieces of plank two inches thick, eight inches wide and five feet long for the bench top and spike them in place to crosspieces, B. Finish the ends of the bench by fitting in some ten-inch pieces, as shown in Fig. 1.

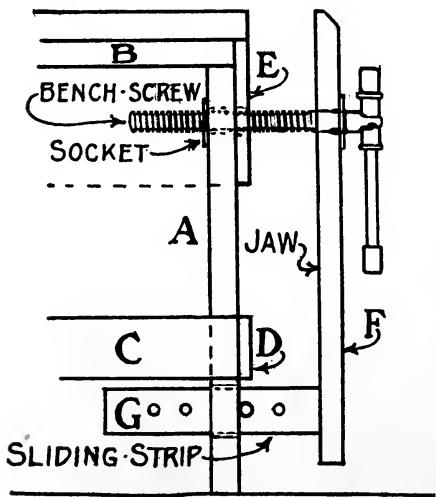


Fig. 3. End View of Work-Bench Showing Construction of Vise

An iron bench-screw can be purchased at a hardware store for fifty or sixty cents, and it is a simple matter to make the rest of the vise (Fig. 3). Cut the jaw F (Fig. 3), out of a plank two inches thick and six inches wide, about thirty inches long, and the sliding-strip, G, out a seven-eighths inch board, three inches wide and fourteen inches long. Bore five holes in a row through the sliding strip (Fig. 3), and then nail the jaw to its end. When this has been done, cut a mortise in the front leg at the left end of the bench, four inches above the floor and a little larger than the sliding-strip (Fig. 2), then slip the end of the sliding-strip through this mortise, push the jaw up against the apron of the bench and drive a couple of nails through the jaw to hold it, temporarily, in place. Describe a circle a trifle larger than the diameter of the iron screw, on the face of the jaw, and cut a hole of this size through

the jaw, apron and bench-leg. A threaded socket comes with the bench-screw and this should be set into the leg and screwed in place (Fig. 3), after which the screw should be slipped through the hole in the jaw and screwed through the socket as far as it will go. Screw the iron plate at the handle end to the face of the jaw. Trim off the top and bevel the outer edge as shown in Figs. 1 and 3, and then remove the temporary nails which you drove into the jaw. Cut a peg to fit in the holes in the sliding-strip and when you use the vise always stick this peg in the proper hole to keep the bottom of the jaw directly under the top. If this is not done, the bottom will push in too far and the jaw will not grip a piece of work squarely. Bore a number of holes through the front apron (Fig 1), and cut a peg to fit in them to support the ends of boards placed in the vise. Nail a small block of wood to the top of the bench for a bench stop. For holding screws, nails and other pieces of metal while filing, get a small iron vise and screw it onto the right end of your bench.

After you have made a work-bench, the next thing to do will be to provide a place in which to keep your tools. When the writer received his first outfit of tools when a boy, he made a chest for them out of an old grocery box, this being the best material at hand, and as it was such an easy matter to turn this box into a chest and it served the purpose so well, he has decided to tell you how to make one just like it. Fig. 4 is a drawing made

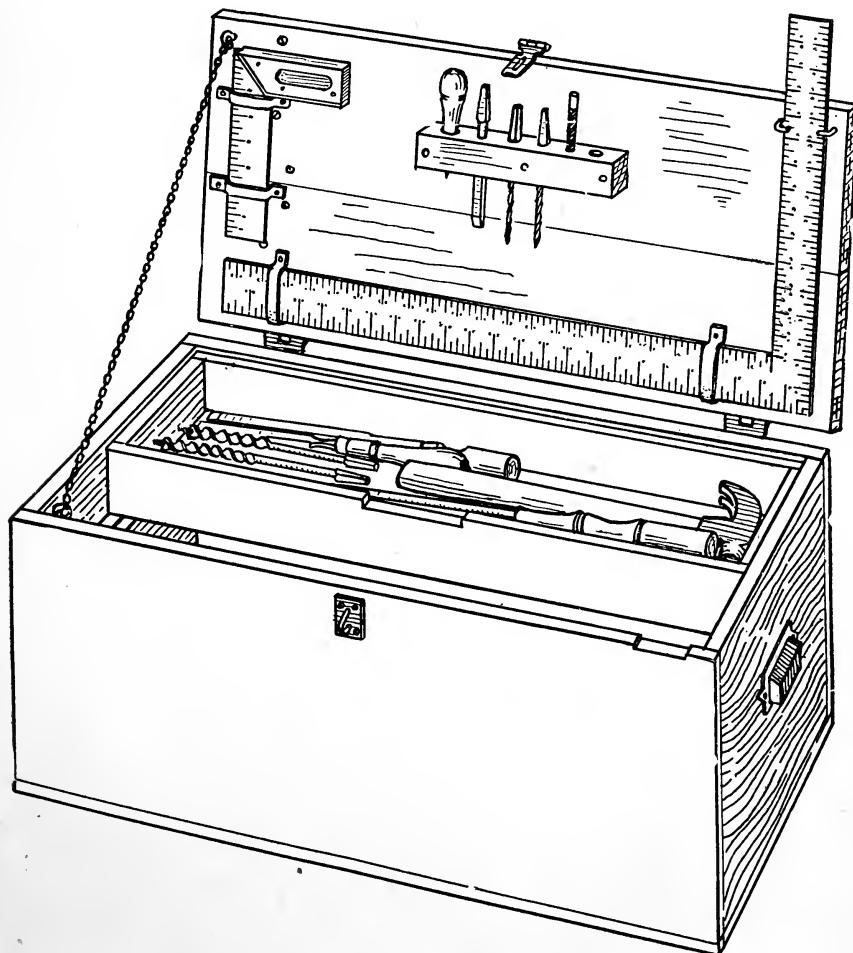


FIG. 4. A GROCERY-BOX TOOL CHEST

from this old chest. The box used was, approximately, 26 inches long, 13 inches wide and 9 inches deep, but yours need not be of these exact dimensions, only be sure it is long enough to accommodate your large tools.

After selecting your box, re-nail all loose boards and replace any that happen to be split with pieces from another box. Fasten together the cover boards with a "batten" at each end (A, Fig. 5), and hinge them to the box with a pair of strap-hinges. Buy a hinge-hasp and staple (Fig. 6) and a pair of drawer-pulls at a hardware store; screw the hasp to the box-cover and the staple to the box, and screw the drawer-pulls to the ends of the box. As a check to prevent the cover from dropping back too far, attach a chain to two screw-eyes screwed into the cover and the box. The tray is removable and sets upon two cleats or strips nailed to the ends of the box. Make this tray one-fourth of an inch shorter than the box, seven inches wide and one and one-half inches deep (inside), and put the bottom, sides and ends together in the same way that a box is made.

Fasten a block with holes of the proper size drilled in it to the inside of the cover, in which to stick such tools as the brad-awls, screw-driver, bit, gimlets and nail-set, and tack some loops of leather to the cover for the squares to slide in. The upper end of the large

square is held by a nail and a screw-hook, and is released by giving the hook a quarter turn. The small tools—the chisels, bits and screw-driver—should be kept in the tray and the large tools—the saws, planes and bit-brace—in the bottom of the chest. Notch the top edge of the box and tray, if necessary, to accommodate the tools on the cover.

When you have completed the chest, sandpaper it well, then give the tray and the inside a coat of boiled linseed-oil and the outside a coat of paint or oil-stain.

A chair makes a splendid saw-bench and will serve the purpose just as well as a carpenter's horse, but it is rather hard on the chair unless the seat is protected in some way, so we will make a wooden cover that can be placed on top of the chair as shown in Fig. 8. Make this cover twenty inches long and sixteen inches wide, and fasten the boards together at the ends with two battens, of just the thickness of the chair-seat and fitted to the curve or slant of the seat (A and B, Fig. 8), and screw a wooden button to each batten. Place several thicknesses of cloth over the chair seat and turn the buttons so they will hold the cover to the seat.

It is necessary to have a mitre-box to guide your saw in making mitres (Fig. 9). This may be made out of pine. Cut the bottom out of a board one and one-eighth inches thick, four inches wide and fourteen inches long, and the sides out of stuff seven-eighths of an inch thick, five inches wide and fourteen inches long,



Fig. 6.

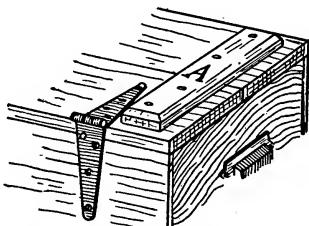


Fig. 5.

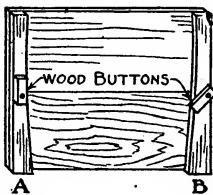
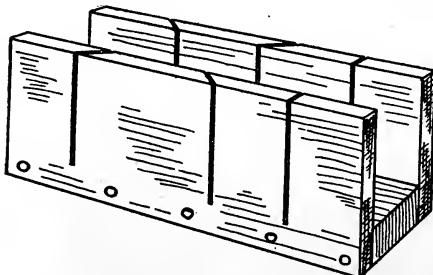
Fig. 7.
A Chair Saw-BenchFig. 8.
Cover to Protect Chair

Fig. 9. A Mitre Box

and nail the sides to the edges of the bottom. Then take the box to a carpenter and ask him to make two mitre cuts and one ninety-degree cut in it. Unless you have had some practice in laying out work and sawing, it would be very difficult for you to do this accurately enough, so it is best to have a carpenter do it for you.

The Story of Cotton

The use of cotton for clothing began so long ago that history does not record it. Columbus found the cotton plant growing wild in the lands he discovered and later explorers found it in Mexico and the southern part of this country. In ancient times the finest cotton goods came from India. The natives attained great skill in spinning the thread. A single pound of thread was often spun so fine as to be one hundred and fifteen miles in length. Muslins were made by these people so fine that when spread upon the



'Way Down South in the Land of Cotton

grass and covered with dew, they became invisible. Much of this cloth was made near the city of Calicut, and from this fact we get the name of our most common of cotton fabrics, calico.

The early settlers in the south at first grew cotton in their gardens for ornament, and it was not until after the Revolutionary War that any considerable attention was given to its cultivation for practical purposes. In 1784 eight bags of cotton were shipped from Charleston, S. C., to London. These were seized on the charge of false entry at the custom-house, as it was stated that it was impossible to raise so much cotton in the United States. A good sized crop in the United States at the present time is twelve million bales and the greater part of the cotton in the world is raised in our southern states.

The value of the cotton plant is not confined to the fibre. For every pound of fibre there are about two pounds of seed. About one-half the seed is kept for the next crop and the remainder is sold at a good price. At the mill the hulls are removed from the seeds, and the kernels crushed between heavy rollers. The oil is pressed out and when refined and purified it becomes useful for many purposes. The cake from which the oil is pressed is ground into meal as food for stock. The hull of the seed is used in the manufacture of paper fibre for making buckets, tubs, etc. Practically nothing of the cotton plant is wasted.

The Cotton Plant

The cotton industry is one of the largest in the United States and employs the largest amount of capital of any industry except iron and steel. Cotton ranks as the second great product of the country being exceeded in value only by corn.

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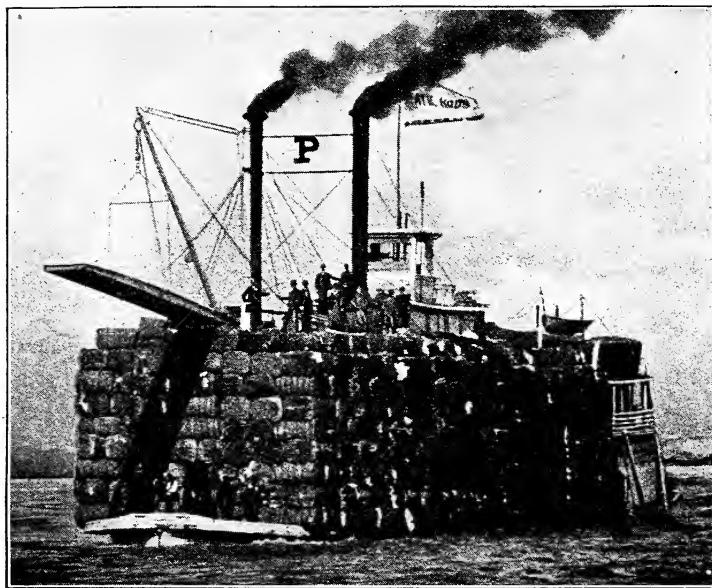
Cotton belongs to the mallow family of plants, and is a near relative to the common hollyhock, the marsh-mallow, and the musk-mallow. All these plants are characterized by

showy flowers, and a mucilage-like sap. Many of them have hairy like stems and leaves, while the cotton plant has a collection of white lint about the seed.

The botanical name of cotton is *gossypium*, from the Arabic word, "goz," which means a silky substance. There are many varieties of the cotton plant, but only three are worthy of mention in connection with our subject. These are the "Sea Island," the "Upland," and the "Tree Cotton." The first two are the varieties grown in this country,

and from them most of the cotton of commerce is obtained. In the language of commerce, "Sea Island" is known as "Long Staple," and "Upland" as "Short Staple." Both varieties are annuals, and must be planted each year. The upland produces a plant about two feet high, and the sea island grows from four to ten feet in height, according to the fertility of the soil, the average height being about four feet. The cotton plant presents a beautiful appearance, having dark green leaves with blue veins and white flowers resembling those of the single hollyhock. The blossom of the sea island variety is pale yellow the first day, red the second, and drops off the third. One seldom beholds a more beautiful sight than a large cotton field in full bloom.

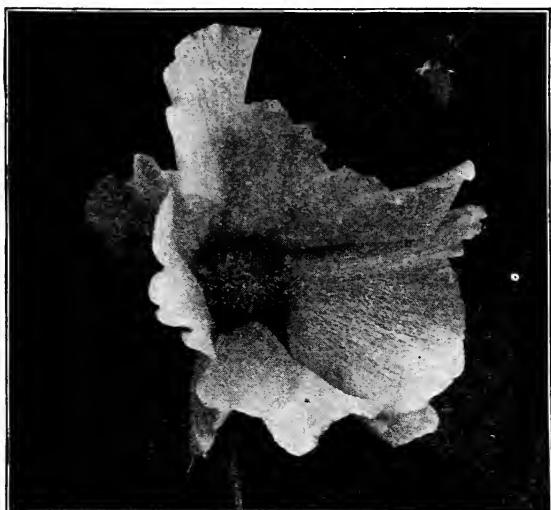
Sea island cot-



On the Mississippi, Loaded with Cotton



A Southern Cotton Market



Blossom of the Cotton Plant

factures, and is in universal demand. It is sometimes called "green cotton" because it produces green seeds. The seed is sown the last of March or first of April, and the young plants are carefully tended during the early summer. The seed begins to ripen about the first of September, when the pod called the "boll," bursts open and sets the imprisoned cotton free and picking begins.

Nearly all the work on the cotton plantation is hand labor, and is performed by the colored people. Most of the cotton is picked by hand. Long sacks or large baskets are used for holding the bolls; when filled these are emptied into wagons which carry the cotton to the gin.

The next process after picking is "ginning," which is running the lint through the gin to separate it from the seeds. The gin turns the cotton out ready to be packed in bales for shipping. The bales are pressed together with a powerful press, wrapped in burlap, and banded with iron. Their weight is from 450 to 550 pounds.

History of Manufacture

In no other industry has the invention of machinery had so great an effect upon the progress and history of the English speaking people, as in the manufacture of cotton goods.

ton is so called because it was first raised on islands along the coast of South Carolina. It is raised on the lowlands along the coast of Georgia and South Carolina, the adjacent islands, and in a few localities in Lower Egypt. It is much more valuable than the upland, as it can be raised only in a limited section of country, and its fibre is much longer, finer, and stronger than that of any other variety. It is sometimes called "black cotton" because it produces black seeds.

The upland variety is extensively cultivated in the Carolinas, Georgia, Alabama, Mississippi, and Louisiana, Texas and Oklahoma, (See Resource Map—group 4 on back of desk) and forms the principal source of wealth in those states. The fibre is used in all the ordinary cotton manu-



Cotton Leaf and Boll

The first method of spinning cotton into thread was to place a bunch of carded cotton on a forked stick, called a distaff, and hold this under the left arm while the right thumb and forefinger drew and twisted the fibre into thread. The size and quality of the thread



Courtesy of Amoskeag Mfg. Co.

Picking Cotton

were regulated by the delicacy of touch as it passed through the fingers. As fast as the thread was spun it was wound on a stick called a spindle. This method prevailed throughout England until the time of Henry VIII. In the early part of the sixteenth century the spinning-wheel was introduced from India. How long it had been in use in that country we are unable to determine.

The spinning wheel was a great advance upon the thumb and finger method. It increased the quantity and improved the quality of the thread. By the old method much of the thread was so uneven that it could not be used. Still only one thread could be spun at a time, and it required weeks to make enough for a web of cloth. The weavers found it difficult to get enough yarn to keep them in steady employment.

The constantly increasing demands for yarn set one of the English workmen, James Hargreaves, to studying the problem, and he invented the spinning jenny in 1767, just when the trouble between England and her American colonies was becoming serious. This invention was really a combination of several spinning wheels under the management of one operator. Hargreaves so arranged the spindles on a frame that they could be turned by one wheel. The operator worked the machine with one hand and controlled the feed with the other. The first jenny contained only eight spindles, but this number was afterwards increased to eighty. Hargreaves' invention created a great sensation among his fellow workmen, who thought it would take away all their employment, and the inventor was obliged to flee for safety. He soon built a small mill at Nottingham, England, where his machine was successfully operated.

The invention of the spinning jenny marks the first great step in the progress of cotton manufacture. Hargreaves was a poor, unlettered workman, and his machine was the result of his native ingenuity. He tried for a long time to spin several threads at once, but without success. One day his little child overturned his machine. As he watched the spindles revolving on the floor like a top, he conceived the idea of placing them in a vertical frame, and the plan succeeded.

Richard Arkwright came to Nottingham soon after Hargreaves. Arkwright invented a machine for spinning by rollers. He also perfected the carding machine so it could prepare the cotton for his spinning machine. These inventions enabled him to produce a firm, even thread, equally suitable for warp and woof. As Arkwright's machine was run by water power, it was called the "water frame." In 1779 Arkwright had 5,000 persons employed in his mills, and he acquired a fortune by the sale of his patents.

The same year Richard Crompton invented the "spinning mule," or "mule-jenny,"



Primitive Roman Distaff and Spindles



The Old Spinning Wheel

which combined the jenny of Hargreaves with the roller frame of Arkwright. This machine, modified by some later improvements, is the one in general use at the present time. The first machines contained only 20 or 30 spindles each; they have since been enlarged until a single machine contains as many as 2,000 spindles, all operated by one person.

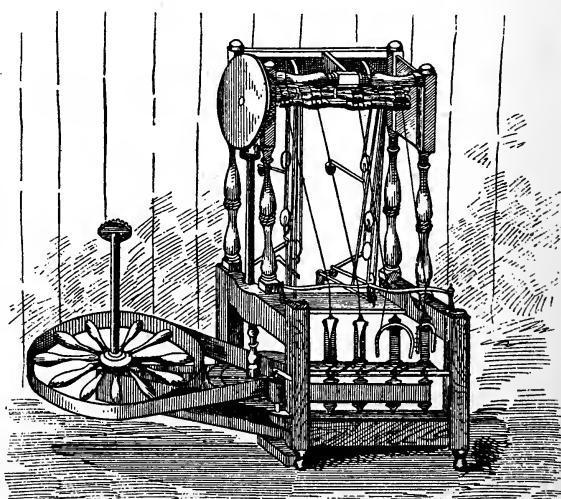
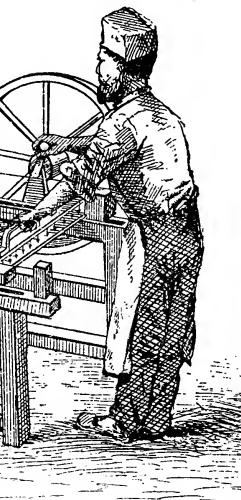
There has been as much progress in the process of weaving as in spinning. The old-fashioned hand loom was a very simple, and very rude structure, but the skill of the weaver enabled him to make good cloth upon it.

All weaving consists of three steps or movements. In order that these may be understood, it is necessary to know the arrangement of the thread for making cloth. The thread running lengthwise of the cloth is called the warp, and that

Hargreaves' Spinning Jenny, A. D. 1767

extending across, the woof, weft, or filling. The first thing the weaver must do in arranging his web is to get the warp in place. The threads must be evenly arranged equally distant from each other, and so fastened as to hold them in position and enable them to be tightly drawn in the frame. The warp must also be so arranged as to permit the alternate threads to cross at a slight angle. The second step is to place the filling, a thread at a time, across the warp in the angle made by the crossing of the threads. The third and final step, consists of driving the filling tightly into the warp and re-crossing the threads for the next thread of filling. The loom is a machine for doing these three things, and, however complicated it may be, all its machinery is arranged to accomplish these purposes.

In the old-fashioned hand loom the warp was wound on a roller, then drawn through two sets of harness, alternate threads in each set, then through the lathe, or batten, and fastened to a second roller on which the cloth was wound as fast as woven. The harness was suspended from the top of the frame on pulleys, and attached to treadles below. The filling was wound on a small spool, called a "bobbin," and placed in a boat-shaped block, called the "shuttle." The operator threw the shuttle across the web in the



Arkwright's Roller Spinning Machine, A. D. 1769

angle made by the crossing of the warp. As the shuttle was thrown, the thread was unwound from the bobbin and left in position. He then brought the batten firmly up against it, sprung the treadles which reversed the warp, and threw the shuttle back to its first position, thus placing another thread ready for the batten. This was the process of weaving by the hand loom, and all the more recent inventions have been in the line of getting perfect machinery to do what the operator did by hand.

Care and skill enabled the weaver to make the most delicate and beautiful fabrics in the hand loom, but it was a slow and laborious process, and many people in England spent their lives in weaving. Their looms were in their own houses, and they took the cloth to their employer when finished, and received their pay and a supply of yarn for the next web. George Eliot's "Silas Marner" gives a good description of these people.

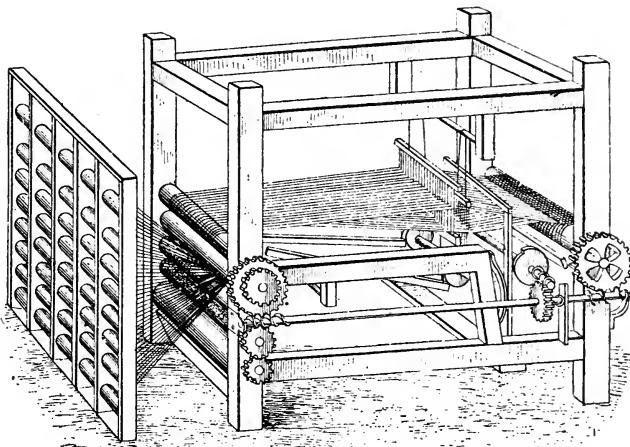
In 1785 Rev. Edmund Cartwright invented the power loom. This invention did as much to advance the manufacture of cloth as did the mule-jenny. The question now was not in growing the cotton, but separating it from the seed.

It was left for Eli Whitney, a graduate of Yale College, to solve the problem by inventing the cotton gin in 1793, which separates the cotton from the seeds which cling to it. The great English historian, Macaulay, said of the cotton gin: "*What Peter the Great did to make Russia dominant, Eli Whitney's invention, the cotton gin, has more than equalled in its relations to the power and progress of the United States.*"

The first cotton mill in the United States was erected at Pawtucket, R. I., by Samuel Slater in 1790. In 1812, Francis C. Lowell of Boston returned from England with the determination of introducing the power loom into this country. Up to this time, all the weaving was done upon the hand loom in the homes of the weavers. In 1822 the first cotton mill was constructed at Lowell, Mass., and the town was named for Mr. Lowell.

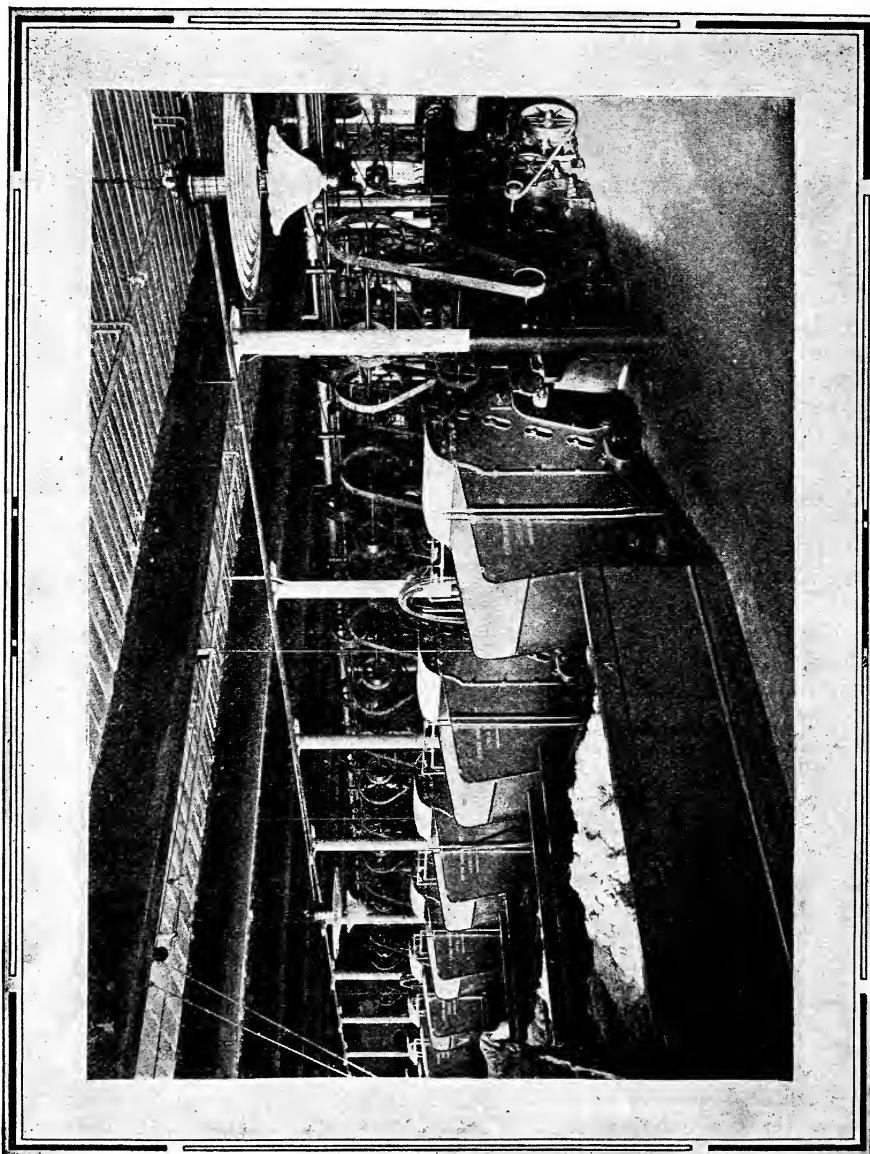
In the Cotton Mill Today

The cotton arrives at the mill in the form of great bales. It is first put through a series of machines called "pickers" that are designed to beat out the leaf and foreign substances that cling to the fibre. These machines deliver the cotton in large rolls, that weigh about forty pounds, much like the rolls of cotton batting sold in the stores, only, of course very much larger. Then, after this preliminary cleaning, the rolls of cotton, or "laps" as they are called, are run through a machine called a "card," which not only takes out all the leaf and foreign matter that may be left in the cotton, but also extracts the short fibres that are not long enough to spin into yarn. The cotton comes from this machine looking something like a rope and is called "sliver." These machines are tended by men and boys. In some mills, where very fine yarns are made, the cotton after being carded is combed, by which process still more of the shorter fibres are taken out, but this combing process is omitted in most mills.



Cartwright Power Loom, A. D. 1785-86

The "sliver" having been put through an evening process, and coiled very carefully in cans made usually of some kind of fibre, like that of a fibre pail, it is wound on a large bobbin, on a machine known as a "slubber." By means of rolls, through which the

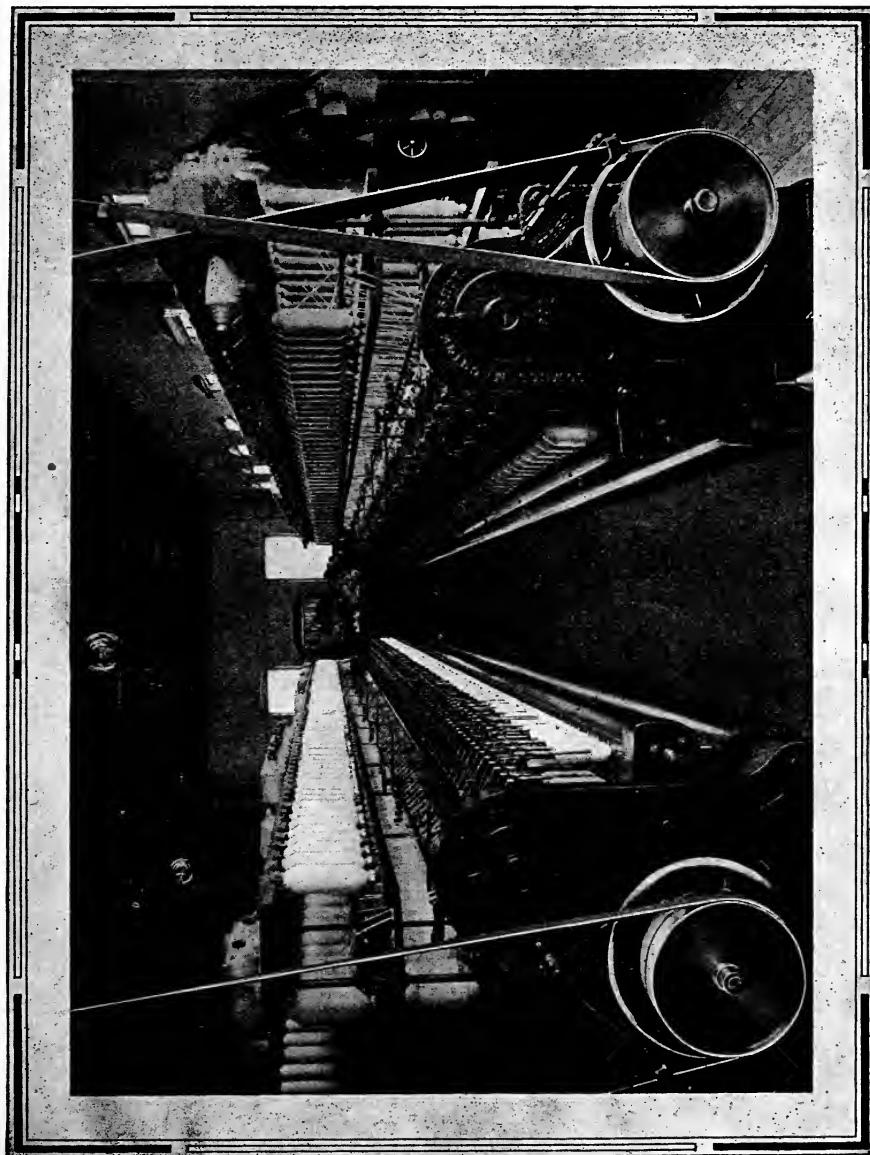


Courtesy of Amoskeag Mfg. Co.

Opener Cotton Pickers

cotton passes, these machines draw the "sliver" down to the diameter of a lead pencil, and this is when it first begins to resemble yarn. These machines are tended by either men or women. The next two or three processes through which the cotton goes are similar

to this last process, the size of the "sliver," now called "roving," being gradually reduced until, when about as large in diameter as ordinary bundle twine, it goes on the spinning frame to be spun into yarn.

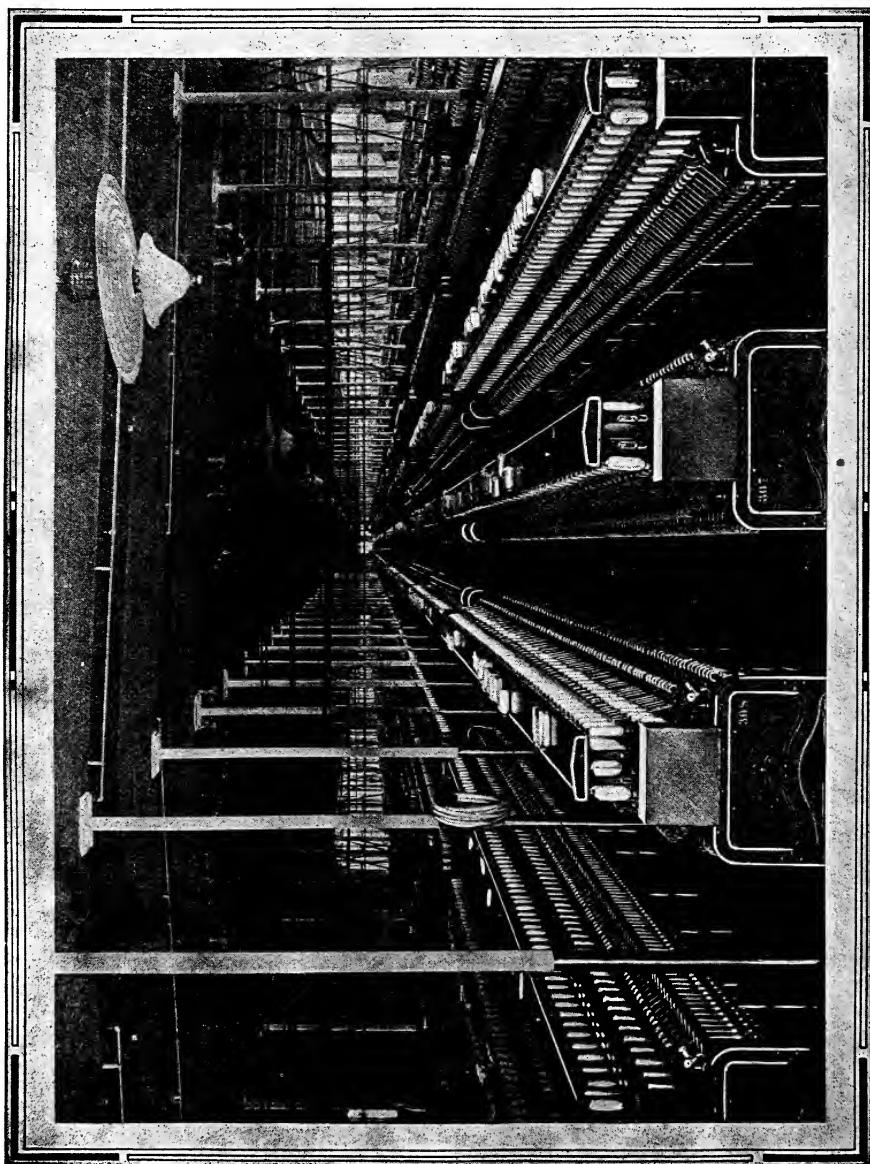


Courtesy of Amoskeag Mfr. Co.

Cotton Roving Frames

There are generally about two hundred spindles on a spinning frame, and on each spindle a bobbin is placed, on which the yarn is wound as it is spun. These spindles revolve very rapidly, sometimes ten thousand times a minute, and receive the roving now

drawn to the fineness of yarn, delivered to them by the rolls just above. Some of this yarn is of course "warp yarn" which forms the warp of the cloth, (i. e., those threads that run longitudinally through it), and some of it "filling yarn" being that which is

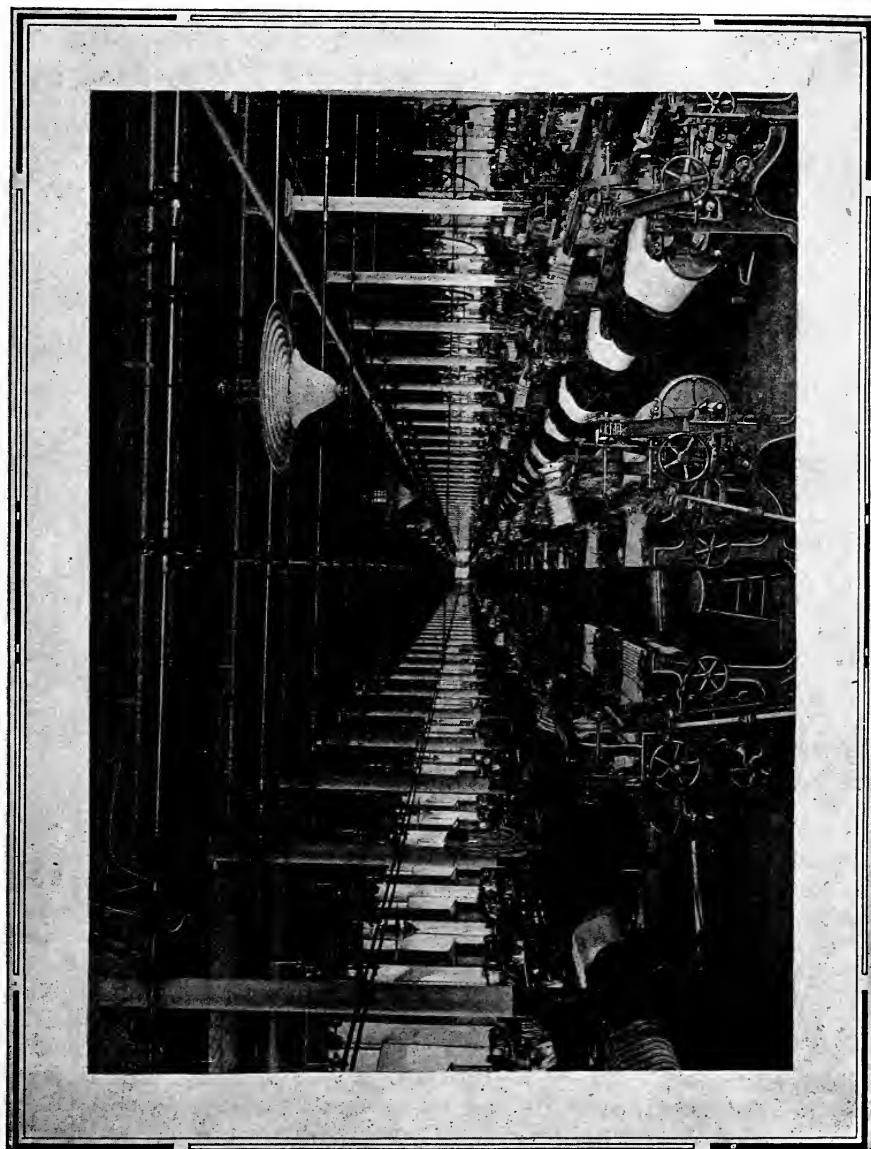


Cotton Spinning Room

Courtesy of Amoskeag Mfg. Co.

put into the "shuttle" and thrown backward and forward in the "loom" through the warp threads, thus forming the cloth. Spinning is the easiest and lightest of the work in the mill, and is usually done by young women and young men. A spinner tends

between six hundred and a thousand spindles, and it is his duty, besides keeping the machine or "frame" as it is called, cleaned, to "piece up" the threads as they occasionally break while being wound on the bobbin.



Courtesy of Amoskeag Mfg. Co.

Cotton Weaving Room

From Wool to Cloth

One hundred and fifty years ago, in the days of homespun, when spinning and weaving were a prominent part of each household's duties, the value and quality of cloth was a matter of common knowledge. Familiarity with the process of making fabrics brought a general acquaintance with cloth, that does not now exist.

Many persons today do not know the difference between worsteds and woolens—many more cannot distinguish between those of a good and those of an inferior grade. This ignorance of quality is not to be wondered at when we consider that what was once a part of household work has become a great national industry.

The inability to judge cloth is a matter not only detrimental to the interests of the consumer, but also to those of the manufacturer. No reputable manufacturer can afford to give the consumer less than the full value for his money; but that the consumer may know that goods are as represented it is necessary that he should understand something about the process of manufacture and thus be assisted in determining the quality of the article.

The great clothing-wool-producing countries of the world are those of Australia, South America, the United States and South Africa.

The world's wool production for 1910 was estimated at 2,952,782,985 pounds, of which the United States was supposed to have raised about 321,362,750 pounds, over one-tenth of the total.

It is estimated that about two-thirds of the clothing wool used by American manufacturers is raised in the United States.

The largest producer of the best wool, that is of the finest fibre, is Australia, but much of the wool raised in the United States, (See Resource Map) particularly in Ohio, Pennsylvania and West Virginia, is of very fine quality—fairly rivalling that of Australia.

There is a great difference in the qualities of different wools. The wools from different countries differ, the wool raised on different breeds of sheep in the same country differ, and the wool raised on any single sheep is not all of the same value for manufacturing purposes.

The best wool in soundness of fibre, softness and evenness of length, comes from the shoulders and sides of the sheep.

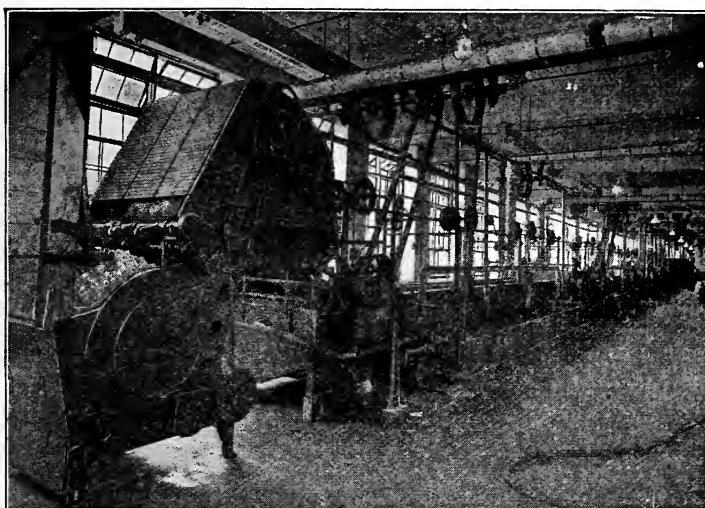
When the fleece is removed from the sheep by a skillful shearer, the wool sticks together, and the whole fleece may be spread out like the skin of the animal. Each fleece is tied up separately, and the wool is shipped in bags or bales, containing from one hundred to five hundred pounds each.

When wool is received at the factory it is in fleeces, and each fleece contains different kinds of fibres—long and short—coarse and fine, and it is necessary that these should be sorted into different kinds or grades, as may be desired—perhaps six or eight different kinds, according to the particular uses to which the different qualities are to be put.

The fleece is spread out on a table, the center of which is covered with wire netting, and through this netting part of the dust and other matter from the wool falls while the sorting is going on. Sorters tear with the hands the different parts of the fleece from each other and separate them into piles, according to their different qualities.

All unwashed wool contains a fatty or greasy matter called yolk, which is a secretion from the skin of the sheep. The effect of this yolk is to prevent the fibres of the wool from matting, except at the ends, where, of course, it collects dust, and, forming a sort of a coating, really serves as a protection to the rest of the fleece while on the sheep's back.

After the wool is sorted it is next cleansed or scoured, (Illus. 1) in order to



1. Wool Scouring

bowl. Having passed through the last bowl and set of rollers, the wool is carried on an apron made of slats on chains, to the drying chamber, called the dryer, where is taken out most of the moisture.

The wool is now blown through pipes or carried on trucks to the carding room.

From this point the wool follows one of two different processes of manufacture—that of making into worsteds, or that of making into woolens.

Speaking in a general way, worsted fabrics are made of yarns in which the fibres all lie parallel, and woolens are made of yarns in which the fibres cross or are mixed. Ordinarily, worsteds are made from long staple wools, and woolens from short staple wools.

Worsteds

The next process in the manufacture of worsteds is carding. In this process the wool is passed between cylinders and rollers, from which project the ends of many small wires. These cylinders revolve in opposite directions. The result is the opening, separating and straightening of the fibres; and the wool is delivered in soft strands, which are taken off by the doffer comb and wound upon a wooden roll into the shape of a large ball, known as a card-ball or card-sliver, or put into a revolving can. The sliver from a number of these balls or cans is now taken and put through what is known as the gilling machine, which to a degree straightens the fibres. (Illus. 2 and 3.)

From the gilling machine the wool comes off in soft strands. Four strands are then taken to the balling machine where is made a large ball, ready for the combing. It takes eighteen of these balls to make a set or fill up the comb. By means of the comb the fibre is still further straightened out, the short stock and noil, or nibs, are removed, and when the sliver comes from the combs most of the fibres are parallel to each other. A number of the slivers taken from the comb are then put through two further operations of gilling, and wound into a large ball, which is called a finished top.

The dyeing is done in three ways—in the top, in the thread or skein after being spun, or in the piece after it is woven. If the wool is to be stock dyed—that is, dyed in the top—it is sent to the dyehouse to be dyed the shade required, and afterwards returned to be gilled and re-combed ready for the drawing. (Illus. 4 and 5.)

remove all this yolk, dirt and foreign matter, and this is accomplished by passing the wool, by means of automatic rakes, through a washing machine, consisting of a set of three or four vats or bowls, which contain a cleansing solution of warm, soapy water, until all the grease and dirt have been removed.

Each bowl has its set of rollers, which squeezes out the water from the wool before it passes into the next

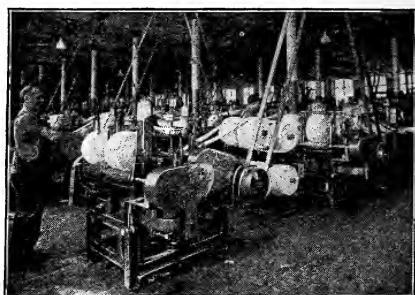
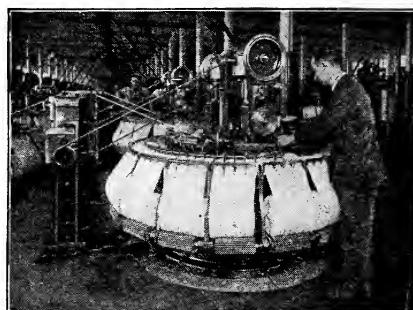
HOME SPHERE OF CHILD LIFE

Up to this point there has been no twist given to the wool, nor any appearance of a thread. The top, the soft untwisted end, is now run through the drawing machine, the process sometimes consisting of nine distinct operations, and is drawn and redrawn until reduced to the size required for its special purpose; and the stock is then delivered to the spinning room on spools, and is called roving. (Illus. 6.)

In the spinning the process of drawing continues until the twisted thread is reduced to the size required, which, either singly or twisted together in two, three or four strands, is to be used for weaving.

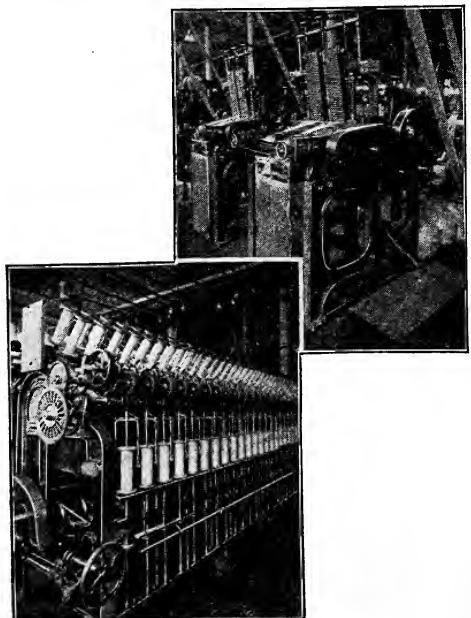
The yarn is then very carefully inspected, and all imperfections which would show in the finished goods are removed, and, if it is to be dyed in the skein, the yarn is taken to a reel, where the skeins are made ready for the dye house. (Illus. 7.)

The threads must now be prepared for the loom, in order that the actual weaving may be done. The thread is used in two ways in weaving—as warp, which is the thread which runs lengthwise of the cloth, and as filling, or woof, which runs across the cloth from side to side.



2. Combing

3. Gilling and Making Top after Combing



4. Gilling—First Operation, English Drawing

5. Reducer—English Drawing

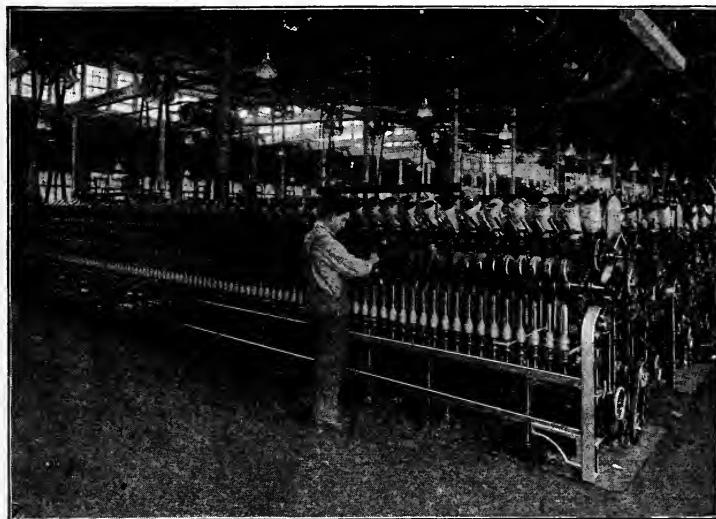
The warp threads—the threads which run lengthwise of the cloth—are sized and wound upon large reels, and from these transferred to a large wooden roll called the warp beam, which holds all the warp threads, usually several thousands.

The filling threads are put on shuttle bobbins and placed in the shuttles to be re-filled by the operatives as required, and as the weaving progresses.

The warp beam is then taken to the drawing-in room, (Illus. 8) where these several thousand threads are drawn through wire heddles in a frame called the harness, then drawn through a wire reed. The completed warp beam is now ready for the loom. (Illus. 9.)

The harnesses are placed in the loom, and by means of what is called the "head-motion," part of the threads are raised and part are lowered. This allows the filling shuttles to pass above some threads and below others, filling out the pattern required. (Illus. 10.)

The cloth, having been made in such



6. English Cap Spinning

through a fulling machine where, moistened with a specially prepared soap, it is subjected to a great pressure and pounding, which aids in giving the required finish.

There are different kinds of finishes which require treatments, and it would be impracticable for us to dwell in detail upon this matter here.

If dyed in the piece, the web or cloth is taken to the dyehouse and dyed. It is thoroughly rinsed, all moisture is extracted from it, and it is dried.

After drying, the cloth is run through a machine by which it is brushed and sheared, the brushing lifting the long fibres, and the shearing cutting them off at even length. The cloth is put through the press, which irons it out, giving it the lustre or the finish that is desired. It is examined again for further imperfections, and if such have occurred they are corrected.

Measuring, weighing, rolling and tagging follow, and the cloth is packed and ready for the market.

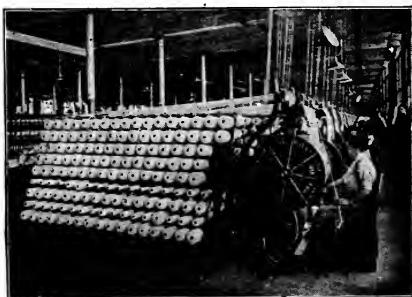
Woolens

Woolens are made from short staple wools, known as clothing wools, and in the finished woolens the fibres of the yarns cross or are mingled together. In the case of woolens, after the scouring, it is frequently necessary to remove burrs or other vegetable matter from the wool. To accomplish this the wool is dipped in a bath of chloride of

length as is desired, is taken from the loom, and, by what is known as burling and mending, any knots or threads woven in wrongly are removed, and any imperfections which have been discovered through a careful examination are corrected. (Illus. 12, 13 and 14.)

The web or cloth is scoured or washed and the oil and any foreign matter removed. (Illus. 11.)

Undressed fabrics would now be fulled. This consists of running cloth



7. Ring Twisting

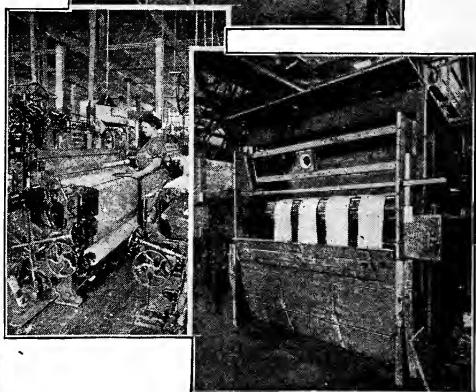
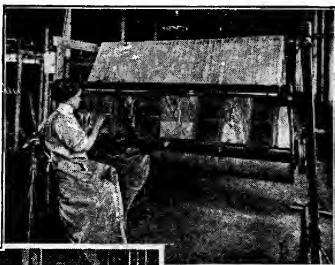
8. Beaming and Yarn Inspecting

aluminum or sulphuric acid solution, then the moisture is extracted and the wool is put through a drier, where the temperature must be at least 212 degrees. This heat carbonizes the foreign substance, but has little effect on the animal fibres of the wool.

Next, an ingenious machine called the burr picker removes the burr.

Sometimes there is to be a blend of the wool with other stocks, and in that case the several different wools are mixed together.

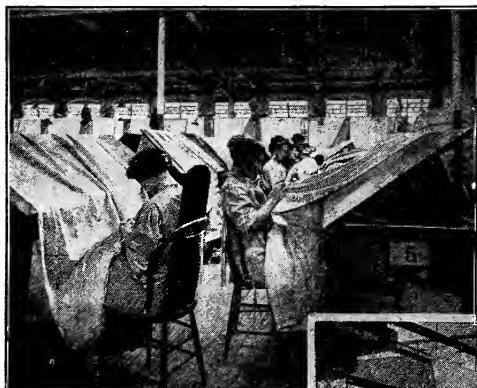
Dyeing of woolens is done in three ways—in the wool, in the thread after it is spun, or in the piece after it is woven. If the wool is to be "dyed in the wool"



9. Drawing in Warp Threads

11. Scouring Cloth

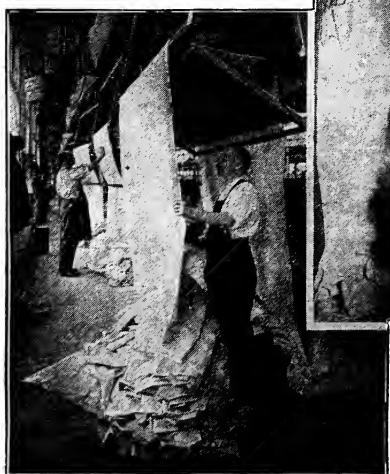
10. Weaving



12. Mending Room



13. Burling—Raising Knots



14. Mending Perching

it is now conveyed to the dyehouse, dyed the shade required, then returned to the mixing room.

During the process of scouring, when the yolk was removed, a large part of the natural oil of the wool was also eliminated, and, in order to restore this lubricant, the wool is sprinkled with an oil emulsion, and the mixing picker thoroughly blends the wools.

From here the wool goes to the cardroom, and by means of the carding machine the fibres are carded and drawn and delivered to the finisher in a broad, flat sheet. By means of the condenser it is

divided into narrow bands, and the wool—free as yet from twist—comes out in soft strands. These strands or threads are called roping.

Now comes the mule spinning. The roping passes through rolls by which it is drawn and twisted to the size required, and wound on paper cop tubes or bobbins. Such of the yarn as is to be used for warp is then spooled from the bobbins to dresser spools. It is sized and wound upon large reels; from these transferred to the warp beam, as in the case of worsteds.

The processes of drawing-in, preparation for weaving, burling and mending are practically the same as in the case of worsteds.

The finishing processes of woolens, like the finishing processes of worsteds, vary with different fabrics, some fabrics being scoured and cleansed in the washers before fulling, others going to the fulling mill without cleansing. After fulling, the cloth is again washed and rinsed, and if necessary to remove any vegetable fibres it is carbonized.

Napping or gigging raises the fibres to the nap desired. Gigging is done by means of a wire napping machine or teasel gig, which raises the ends of the fibres on the face of the cloth. The teasel is a vegetable product about the shape of a pine cone, and it is interesting to note that no mechanical contrivance has ever been invented to equal it for the purpose.

The napping which has been raised by the teasel is sheared or cut to a proper length by machine. The cloth is pressed, and, if it is desired to finish it with lustre, it is wound upon copper cylinders and steam is forced through it at a high pressure.

Next the cloth is dyed, if it is to be piece-dyed—that is, dyed in the piece. If the cloth is a mixture, the wool was dyed immediately after the scouring. In worsteds the dyeing is done either just after it has been subjected to the first combing processes, or the yarn is dyed in the skein or hank.

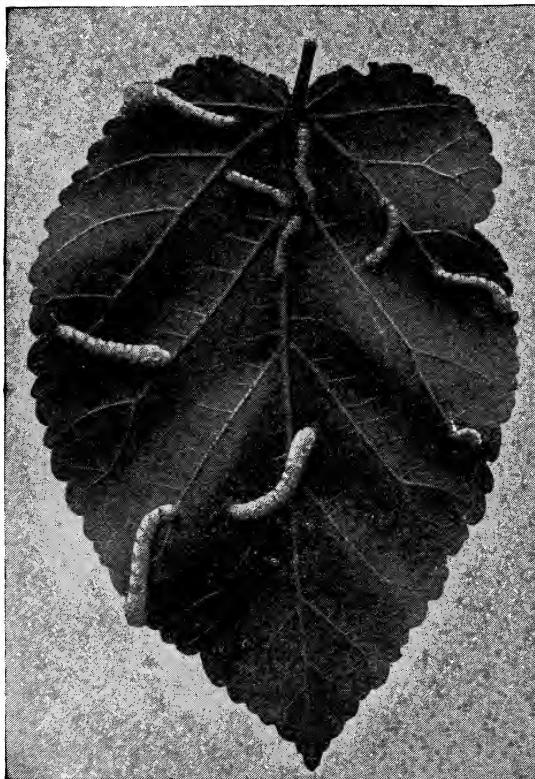
In the dry finishing the cloth is finished with various kinds of finishes desired, and it is steamed, brushed, sheared and pressed. Another examination for any imperfections or defects follows; the cloth is measured, packed and tagged and is ready for the market.

The difference between worsteds and woolens is principally that in the threads or yarns from which worsteds are made the fibres of the wool lie parallel, one to another, being made from combed wool, from which the short fibres have been removed; and woolens are made from yarns in which the fibres cross and are matted and intermixed. When finished the effect of worsteds and woolens is materially different. Upon examination it will be found that the worsted thread resembles a wire in evenness, while the woolen thread is uneven and irregular.

A worsted fabric when finished has a clear, bright, well defined pattern, seems close and firmly woven, and is of a pronounced dressy effect; while woolen cloths are softer, they are more elastic, the colors are more blended, the threads are not so easily distinguishable and the general effect is duller.

The Story of Silk

The history of silk starts with Hoang-Ti, the third Emperor of China, who charged his wife and queen, Si-Ling-Chi, to examine the silkworms and test the practicability of using the thread from the cocoons. In her zeal she collected large numbers of the worms, fed them herself, and discovered how to reel the silk and to make it into garments. This was about 1700 B. C., and for her discovery she was deified, so the Chinese records say, and ever since has been known as the "Goddess of Silkworms."



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Corticelli Silkworms—Six and Ten Days Old

her associates in the Island of Cos (the modern Zee in the Ægean Sea) had imported raw silk from Persia, and unraveling it had woven a silken gauze, which from its transparency was called "woven wind." Soon the Roman ladies followed her example, substituting for silk fine threads of linen or cotton for the weft or filling, and before long it became in great demand. The Roman emperors arrayed themselves in costly silken garments, and soon laws were passed restricting its use to the nobility and to women. The Emperor Aurelian is said to have refused his empress a silken robe on the ground of its great costliness.

In the sixth century A. D., all the raw silk was still being imported from China, by way of Persia, when the Emperor Justinian, having engaged in war with Persia, found his supply of raw silk cut off and the manufacturers in great distress. No one, on pain of death, was allowed to export the silkworm eggs from China, but Justinian bribed two

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Silkworms About Eighteen Days Old

revived until 1826, when a most determined effort was made to place silk growing on a paying basis. For ten years all went well; several states offered premiums and bounties, silk societies were formed, and new machinery was invented and put into operation. But soon a disturbing element was introduced; a great effort was made to supplant the white mulberry (*Morus alba*), on the leaves of which the worms had been fed, by the so-called Chinese mulberry, the *Morus multicaulis*, on account of the superior qualities claimed for it. A sudden infatuation seized the people, speculation began, and prices advanced far beyond their real value.

Since 1830 Florence, Mass., had been identified with the silk culture movement, and the whole surrounding country soon caught the fever, and as the excitement increased acres of mulberry cuttings and trees were planted. Then in 1839 came the crash. The bubble had burst, bringing ruin to thousands of persons, and mulberry twigs which had been worth nearly their weight in gold could not be sold for ten cents a hundred. A severe winter killed most of the trees, giving the industry a final blow.

The company at Florence gave up silk growing for a few years, but the manufacture of Corticelli Silk, started in 1838, was continued, and from that day to this the products of the famous Corticelli Silk Mills have always enjoyed an enviable but well earned reputation for superiority.

It is a fact not generally appreciated that silk is the strongest fiber known to science as well as the only fiber which is proof against decay caused by dampness. Cotton will soon mildew and rot away, while silk is in its element when wet, and may even be soaked in water without impairing its strength. In these days of keen competition many imitations of silk are sold under various fancy and deceptive names, but no substitute invented by man

Nestorian monks to return to that country, and in 555 they came back bringing with them a quantity of silkworm eggs concealed in the hollow of their pilgrims' staves. The industry now spread rapidly over Greece and Syria, into Spain in 711, into Sicily and Naples in the twelfth century, reaching Italy in the sixteenth and France in the seventeenth century.

For centuries the finest and richest silks were woven only for the church, the nobility, and the most wealthy knights; Persia, China, and the countries to the far East producing magnificent hand embroidered specimens, the results of years of patient labor.

Silk culture in America started in 1622, when James I. sent silkworm eggs, mulberry trees, and printed instructions to Virginia, but the attempt was not successful. In 1735 eight pounds of silk were exported from Georgia, and seven hundred pounds in 1758, and over ten thousand pounds (seventy-five thousand dollars' worth) in 1759.

Connecticut began to rear silkworms in 1760, and for eighty-four years this state led all others in the amount of silk produced. Soon after 1769 Pennsylvania, New Jersey, New York, Rhode Island, and Massachusetts became interested in the industry, but during the Revolution it was given up, and was not

can replace the wonderful work of nature in the Silkworm.

The Silkworm

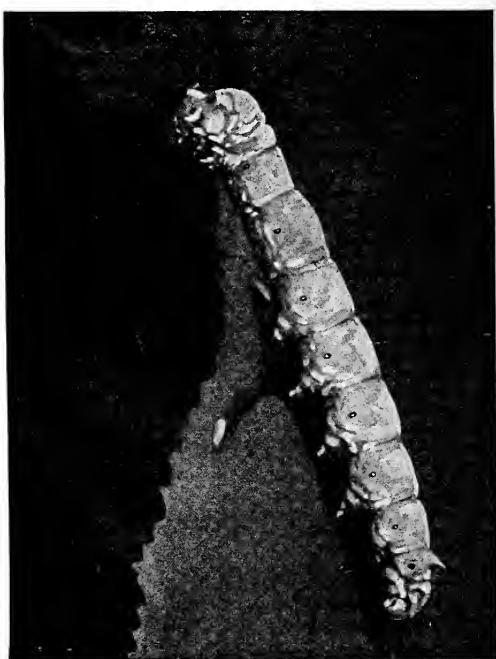
The wonderful insect that makes the silk is the larva of a small moth called *Sericaria mori*. This moth is classed with the *Lepidoptera*, or scaly winged insects, family *Bombycidæ*, or spinners. This species of caterpillar is commonly called the Mulberry Silkworm. First reared in China, it is now extensively cultivated in China, Japan, Italy, France, Spain, and other European countries. Owing to the greater value of labor here, the United States cannot compete with these countries in the production of raw silk.

The silkworm has become domesticated, since, during the long centuries in which it has been cultivated, it has acquired many useful peculiarities. Man has striven to increase its silk producing power, and in this he has succeeded, for, by comparing the cocoon of the silkworm of today with its wild relations, the *Corticelli* cocoon is found to be much larger, even in proportion to the size of the worm that makes it or the moth that issues from it. The moth's loss of the power of flight and the white color of the species are probably the results of domestication.

The silk moth exists in four states—egg, larva, chrysalis, and adult. The egg of the moth is nearly round, slightly flattened, and closely resembles a turnip seed. When first laid it is yellow, soon turning a gray or slate color if impregnated. It has a small spot on one end called the micropyle, and when the worm hatches, which in our climate is about the first of June, it gnaws a hole through this spot. Black in color, scarcely an eighth of an inch in length, covered with long hair, with a shiny nose, and sixteen small legs, the baby worm is born, leaving the shell of the egg white and transparent.

Small and tender leaves of the white mulberry (*Morus alba*), or osage orange (*Maclura aurantiaca*), are fed, the young worm simply piercing them and sucking the sap. Soon the worm becomes large enough to eat the tender portions between the veins of the leaf. In eating they hold the leaves by the six forward feet, and then cut off semi-circular slices from the leaf's edge by the sharp upper portion of the mouth. The jaws move sidewise, and several thousand worms eating make a noise like falling rain.

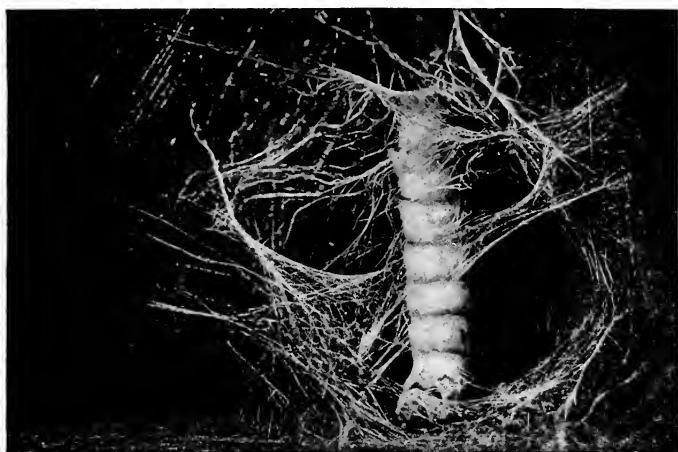
The *Corticelli* worms are kept on trays made of matting, that are placed on racks for convenience in handling. The leaves are placed



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Corticelli Silkworm Eating



COPYRIGHT 1905, BY NONOTUCK SILK CO.
Full Grown Silkworm, Showing Position in Molting



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Silkworm Preparing to Form Its Cocoon

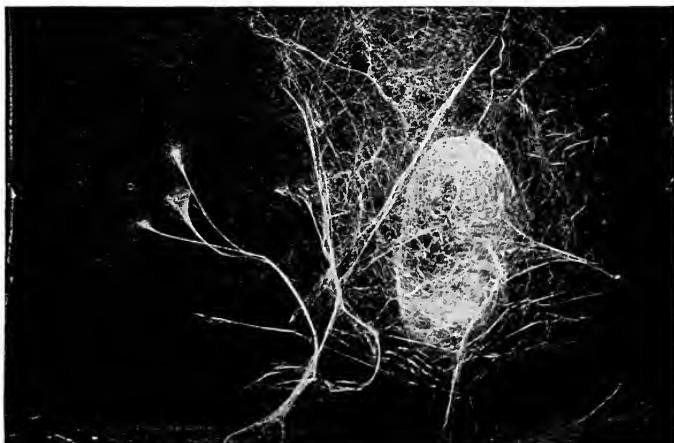
are velvety, smooth, and cold to the touch, and the flesh is firm, the pulsation of the blood may be traced on the back of the worm, running towards the head.

The worm has four molting seasons, at each of which it sheds its old skin for a new one, since in the very rapid growth of the worm the old skin cannot keep pace with the growth of the body. The periods between these different molts are called "ages," there being five, the first extending from the time of hatching to the end of the first molt, and the last from the end of the fourth molt to the transformation of the insect into a chrysalis. The time between the four "molts" will be found to vary, depending upon the species of worm.

When the worm molts it ceases eating, grows slightly lighter in color, fastens itself firmly by the ten prolegs, and especially by the last two, to some object, and holding up its head and the fore part of its body remains in a torpid state for nearly two days. For a day or two previous to molting a dark spot is noticed just above the nose of the worm, from which the head emerges apparently renewed. In molting the old skin breaks at the nose, the head is pushed out, and the worm by wriggling and twisting gradually works the old skin back from segment to segment until entirely cast off. Weak and feeble, it gains strength by resting, and then, freshened, supple, and hungry, goes to work eating again with renewed vigor and apparently determined to make up for lost time.

By each successive molt the worm grows lighter, finally becoming a slate or cream white color, and the hair, which was long at first, gradually disappears. Two days after the third

beside the worms, or upon a slatted or perforated tray placed above them, and those that crawl off are retained, while the weak ones are removed with the old leaves. The worms breathe through spiracles, small holes which look like black spots, one row of nine down each side of the body. They have no eyes, but are quite sensitive to a jar, and if you hit the rack they stop eating and throw their heads to one side. They

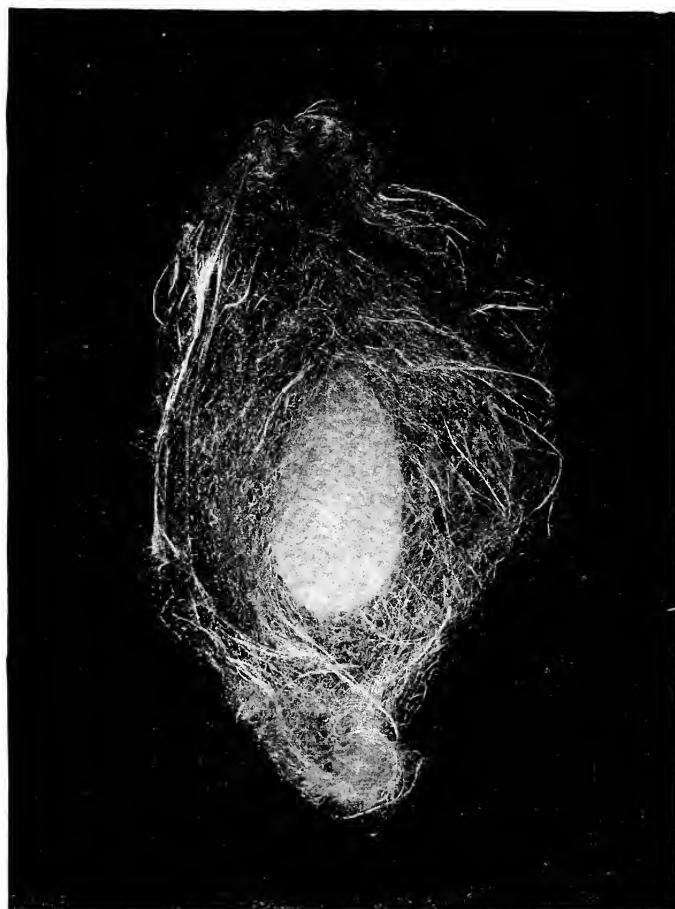


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Cocoon Begun—Silkworm Can Still Be Seen

molt, when the worm is fifteen days old, it is three-quarters of an inch long, and just after the last molt it is one and a fourth inches long. If its growth seemed rapid before, it is as nothing compared to its growth now. In six days it grows from one and a fourth to two inches in length, and in three days more becomes fully three inches in length. It is an interesting fact that nearly or quite three-fourths of the silk the worm spins is made or secreted in these last two or three days. However,

at all ages and times the worm secretes silk with which to protect itself from injury, for when in danger of falling it instantly fastens a silken thread to whatever it may be standing upon. In case of accident, the worm uses this thread, which is strong enough to sustain its weight, as a ladder to go either up or down. In ascending the thread is wound around its forelegs to shorten it. When the worm is young the thread is so fine as to be almost invisible, yet it is always strong enough to sustain the worm.

Having attained full growth, the worm is ready to spin its cocoon. It loses its appetite, shrinks nearly an inch in length, grows nearly transparent, often acquiring a pinkish hue, becomes restless, seeks a quite place or corner, and moves its head from side to side in an effort



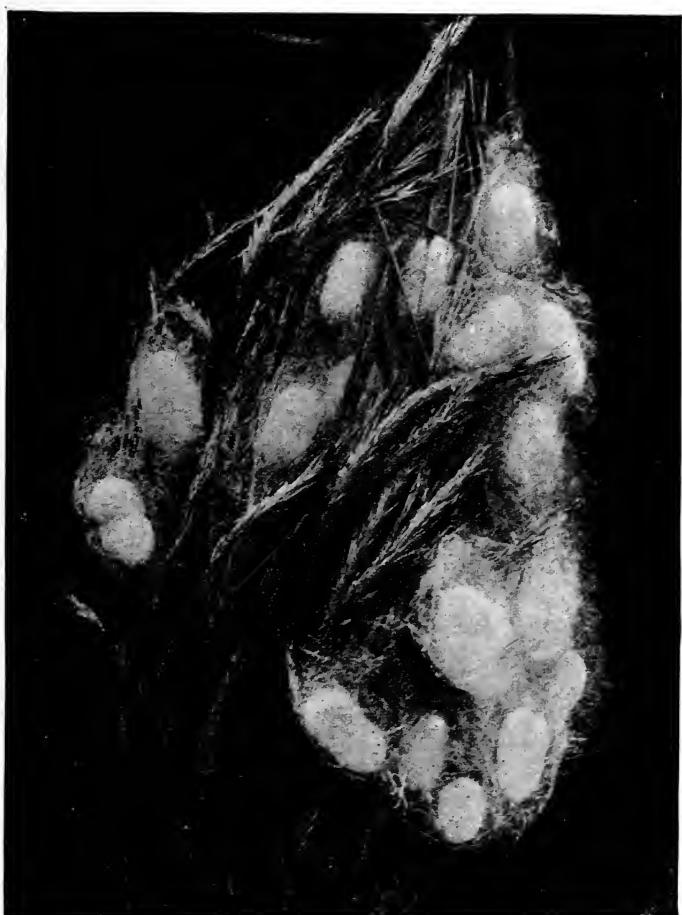
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Completed Corticelli Cocoon

to find objects on which to attach its guy lines within which to build its cocoon. The silk is elaborated in a semi-fluid condition in two long, convoluted vessels or glands between the prolegs and head, one upon each side of the alimentary canal. As these vessels approach the head they grow more slender, and finally unite within the spinneret, a small double orifice below the mouth, from which the silk issues in a glutinous state and apparently in a single thread. The gummy liquid which combines the two strands hardens immediately on exposure to the air.

The worm works incessantly, forcing the silk out by the contraction of its body. The thin, gauze-like network which soon surrounds it gradually thickens, until, twenty-four hours after beginning to spin, the worm is nearly hidden from view. However, the cocoon is not completed for about three days.

The cocoon is tough, strong, and compact, composed of a firm, continuous thread, which is, however, not wound in concentric circles, but irregularly in short figure eight loops, first in one place and then in another. The motion of the worm's head when starting the cocoon is very rapid, and nine to twelve inches of silk flow from the spinneret in a minute, but later the average would be about half this amount per minute.



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Corticelli Cocoons as Spun by Silkworms in a Bundle of Straw

the chrysalis, an oval cone one inch in length. It is a light yellow in color, and immediately after molting is soft to the touch. The ten prolegs of the worm have disappeared, the four wings of the future moth are folded over the breast, together with the six legs and two feelers, or antennæ. It soon turns brown, and the skin hardens into a tough shell. Nature provides the cocoon to protect the worm from the elements while it is being transformed into a chrysalis, and thence into the moth.

With no jaws, and confined within the narrow space of the cocoon, the moth has some difficulty in escaping. After two or three weeks the shell of the chrysalis bursts, and the moth ejects against the end of the cocoon a strongly alkaline liquid which moistens and dissolves the hard, gummy lining. Pushing aside some of the silken threads and break-

The silk secretion, on account of its transparency, is sometimes used for snells, the tough, sinew-like cords by which fishhooks are attached to longer lines, and in foreign countries large numbers of worms are annually used for this purpose. When the worm is ready to spin, after being steeped in strong chemicals, the silk glands are taken from its body, and are dexterously drawn out to the desired length. One gland is usually sufficient for two and sometimes for three fishhooks.

The color of the worm's prolegs before spinning indicates the color the cocoon will be. This varies in different species, and may be a silvery white, cream, yellow, lemon, or green.

When the worm has finished spinning, it is one and a quarter inches long. Two days later, by a final molt, its dried-up skin breaks at the nose and is crowded back off the body, revealing

ing others, with crimped and damp wings the moth emerges; and the exit once effected, the wings soon expand and dry.

The escape of the moth, however, breaks so many threads that the cocoons are ruined for reeling, and consequently, when ten days old, all those not intended for seed are placed in a steam heater to stifle the chrysalis, and the silk may then be reeled at any future time.

The moths are cream white in color. They have no mouths, but do have eyes, which is just the reverse of the case of the worm. From the time it begins to spin until the moth dies, the insect takes no nourishment. The six forward legs of the worm become the legs of the moth. Soon after mating the eggs are laid.

The male has broader feelers than the female, is smaller in size, and quite active. The female lays half her eggs, rests a few hours, and then lays the remainder. Her two or three days' life is spent within a space occupying less than six inches in diameter.

One moth lays from three to four hundred eggs, depositing them over an even surface. In some species a gummy liquid sticks the eggs to the object upon which they are laid. In the large cocoon varieties there are full thirty thousand eggs in a single ounce avoirdupois. It takes from twenty-five hundred to three thousand cocoons to make a pound of reeled silk. Do you wonder that, centuries ago, silk was valued at its weight in gold?



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Corticelli Cocoons from Which the Moths Have Emerged



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Moths Emerging from Corticelli Cocoons

of ten hours. Silk, once regarded as a luxury, is now considered a necessity.

Growers of silk in the United States, by working early and late every day during the season, which lasts from six to eight weeks, could scarcely average fifteen cents for a day's labor.

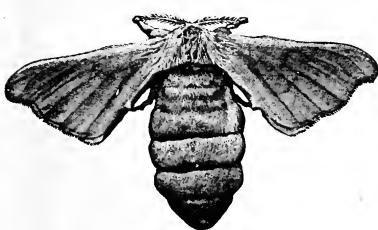
Reeling the Silk from the Cocoons

Reeling the silk from the cocoons is not often done in the United States, as most of the raw material which is imported comes reeled all ready for the manufacturer.



Male Corticelli Moth

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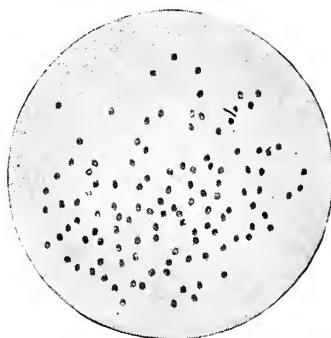


Female Corticelli Moth

coon shows but one thread. These three operations are called "soaking," "brushing," and "cleansing."

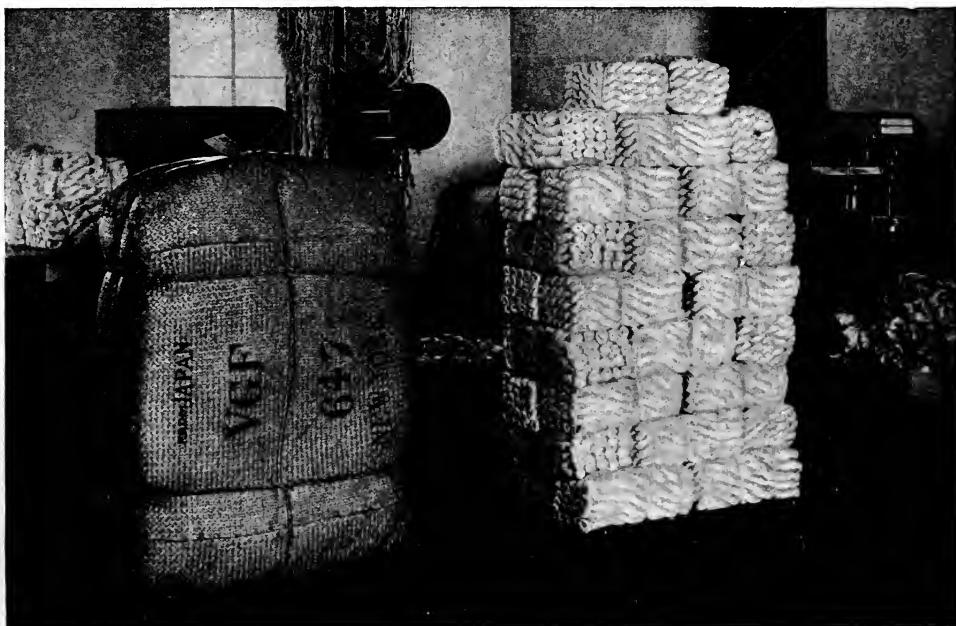
Into one or two compartments in a basin of warm water below the reel are placed four or more cocoons, according to the size of the thread desired. The threads from the cocoons in each compartment are gathered together and, after passing through two separate perforated agates a few inches above the surface of the water, are brought together and

The cocoons are first assorted, those of the same color being placed by themselves, and those of fine and coarse texture likewise. The outside loose silk is then removed, as this cannot be reeled, after which the cocoons are plunged into warm water to soften the "gum" which sticks the threads together. The operator brushes the cocoons with a small broom, to the straws of which their fibers become attached, and then carefully unwinds the loose silk until each co-



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Eggs of the Silkworm Moth



A Bale of Raw Silk and the "Books" It Contains

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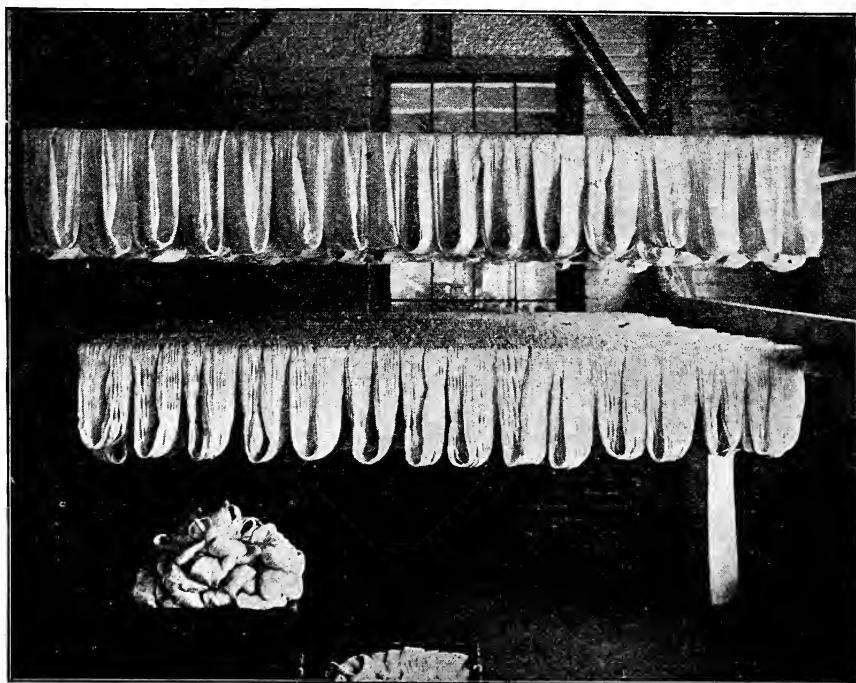
twisted around each other several times, then separated and passed upward over the traverse guide-eyes to the reel. The traverse moves to and fro horizontally, distributing the thread in a broad band over the surface of the reel. The rapid crossing of the thread from side to side of the skein in reeling facilitates handling and unwinding without tangling, the natural gum of the silk sticking the threads to each other on the arms of the reel, thus securing the traverse. Silk reeled by hand or foot power is known as "Re-reel" silk, while silk reeled by power machinery is called "Filature."

The fiber of the cocoon is somewhat finer at the beginning, thickens at the point of forming the more compact part, and then very gradually diminishes in diameter until it becomes so fine as to be incapable of standing the strain of reeling. This is because the silk from one of the worm's two glands is exhausted, leaving but one-half the original fiber.

When one of the threads breaks or the end of one cocoon is reached, the reeler takes a fresh one, and with thumb and forefinger dexterously twists its end around the running thread, of which from that moment it becomes a constituent part.

Imported raw silk comes in skeins of from one to several ounces, packed into bundles called "books," weighing from five to ten pounds. In China and Japan the books are usually sold in bales varying from one hundred to one hundred and sixty pounds.

How Silk Is Manufactured



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Drying Corticelli Raw Silk After Soaking It in Water to Soften the Natural Gum

The Corticelli raw silk is first assorted, according to the size of the fiber, as fine, medium and coarse. The skeins are put into canvas bags and then soaked over night in warm soapsuds. This is necessary to soften the natural gum in the silk, which had stuck the threads together in the arms of the reel. Following the soaking, the skeins are straightened out and hung across poles in a steam-heated room, as shown in the

accompanying photograph. When the skeins are dry, they are ready for the first process of manufacturing. The room we now step into is filled with "winding frames," each containing two long rows of "swifts," from which the silk is wound on to bobbins. The bobbins are large spools about three inches long. The bobbins filled with silk, as wound from the skeins, are next placed on pins of the "doubling frames"; the thread from several bobbins, according to the size of the silk desired, is passed upward through drop wires on to another bobbin. Should one of the threads break, the "drop wire" falls, which action stops the bobbin. By this ingenious device absolute uniformity in the size of Corticelli silk is secured. The "doubling frame" is shown in one of the photographs, and another photograph shows an enlarged view of this frame, giving an idea of the four sections, on each of which are running nine bobbins.

The bobbins taken from the "doubling frame" are next placed on a "spinner." Driven

by an endless belt, at the rate of over six thousand turns a minute, the bobbins revolve, the silk from them being drawn upward on to another bobbin. This spins the several strands brought together by the "doubling process" into one thread, the number of turns depending on the kind of Corticelli silk—Filo silk being spun quite slack, and Machine Twist just the reverse.

A transferring machine combines two or three of these strands; two for sewing silk and three for machine twist; and the bobbin next goes on to the "twisting machine"—a machine that is similar to a "spinner," but the silk is twisted in the opposite direction from the spinning. To stand before these machines and watch how rapidly and how accurately they do the work assigned them is a



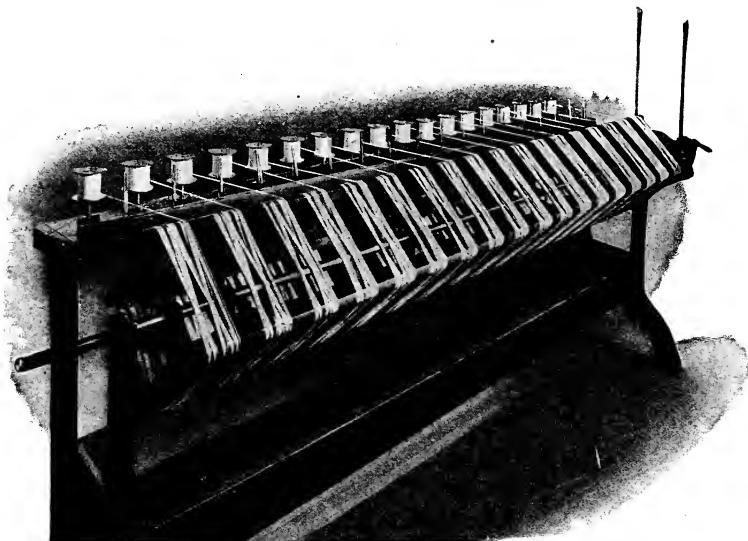
Enlarged View of "Doubling" Frame COPYRIGHT 1905, BY NONOTUCK SILK CO.

realizes how nicely the parts are adjusted. If but one tiny strand breaks that part of the machinery is stopped by an automatic device which works instantaneously and the operator then repairs the broken fiber. As a result only perfect silk can be made. After twisting, the silk is stretched by an ingenious machine called a "water-stretcher." This smoothes and consolidates the constituent fibers, giving an evenness to Corticelli silk not to be obtained by any other known process. The bobbins are placed in water and the silk wound on to

HOME SPHERE OF CHILD LIFE

the lower of the two copper rolls. From the lower roll it passes upward to the upper roll, which turns faster than the lower one, thereby stretching the silk. From the upper roll it passes again on to a bobbin, only to be again reeled off into hanks when it is ready for the dyehouse.

The dyeing process is a very important one, and upon its success depends the permanency



Reeling Corticelli Silk into Skeins to Send to the Dyehouse

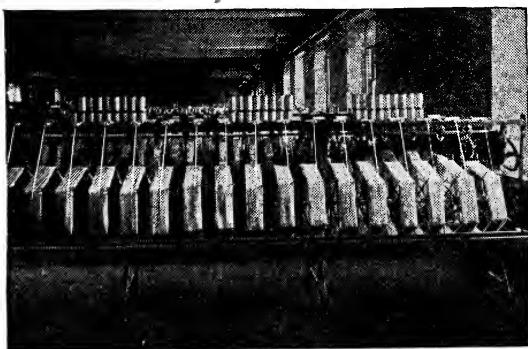
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of the various colors. The Corticelli dyehouse is a model, and the results that come from it are the achievement of years of scientific investigation and experimenting. Vast tubs, tanks, and kettles surround you on every side, and the hissing steam seems to spring from all quarters. The "gum" of the silk is first boiled out by immersion in strong soapsuds for about four hours. The attendants, standing in heavy "clogs" (big shoes with wooden soles two inches thick), turn the silk on the sticks at intervals until the

gum is removed. After the silk is dyed it is put into a "steam finisher," a device looking like a long, narrow box with a cover opening on the side, set upright on top of an iron cylinder. The hanks of silk are placed upon two pins in the steam chest, the cover fastened, and the live steam rushes in around the silk. This brightens the silk, giving it the lustrous, glossy appearance noticeable in all Corticelli goods. The silk comes from this machine quite stiff, and the hanks are next placed on the "stringer," which twists the hank first in one direction and then in the other, as one would wring out water. There

is no water in the silk, however, but this action makes the silk smooth and soft.

From the large skeins the silk is again wound on to bobbins, and then spooled, balled, coned, braided, or skeined, according to the kind of silk and the use for which it is intended. Rows of girls, seated at the rapidly revolving spindles of the spooling



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Winding Corticelli Raw Silk

machines, change the big bobbins to 100-yard spools of Corticelli Spool Silk. The accompanying illustration shows a young lady spooling ounce spools of white Corticelli Machine Twist. The balling machine is equally interesting, as one watches sixteen empty wooden spools transformed as if by magic, in less than three minutes, into sixteen symmetrical balls of Corticelli Crochet Silk.

Then come the labeling and the boxing, and the goods are taken to the stock room, where huge shelves, arranged in tiers, are filled high with silk of every description, from the very finest OOO to the coarsest size, and from the tiny spools of Corticelli Button-hole Twist to the big ounce spools of Corticelli Machine Twist. From the stock room are shipped each day, to the eight wholesale city salesrooms of this company, case after case, packed snugly with neat boxes all filled with spools or skeins of silk, which find their way into the stores of nearly every merchant in the land.

The various uses made of silk are truly wonderful. Some of the ones not generally known are here given. The electrician uses it for insulating wires for the incandescent lamps, for filaments within the same, carbonizing it for this purpose; the surgeon to tie arteries and sew together cuts in the flesh, and to cover silk cloth with gum-tragacanth for adhesive and non-poisonous plasters for wounds and abrasions; the dentist to clean between the teeth and tie the pellicle in filling; the book maker to tie his little fancy booklets and cards; the surveyor to calculate the curve of the earth; and the fisherman to stiffen his rod by winding or to snell the hook with which he deceives the wary fish.

The quantity of raw silk used each year by the Corticelli Mills can scarcely be comprehended. Figures almost lose their meaning. Briefly and approximately stated, three thousand cocoons will yield one pound of silk fiber about seven hundred and fifty miles in length; and as one thousand pounds are used daily by the Corticelli Silk Mills in the manufacture of Corticelli silk thread, it follows that the product of three million cocoons is required, yielding an aggregate length of seven hundred and fifty thousand miles of cocoon fiber, to operate the mills one day. About one hundred cocoon fibers are required to make medium thickness sewing silk, hence the daily product of Corticelli Silk Mills is about seven thousand five hundred miles of finished silk thread—enough to girdle the world in three and one-third days.

Woven Silk*

The threads that run lengthwise in cloth are called warp. The warp is usually made by placing a large number of bobbins on a rack or creel and running the threads from this on a reel, winding off as many yards as required for the length of the warp; this is called a section. Enough sections are put on the reel to produce the desired number of ends or threads in the warp. The whole number of threads is then wound from the reel to a roll or loom beam.

The threads or ends of the warp are next drawn through the harness and reed. The harness is made up of a number of shafts or leaves; each shaft or leaf is a series of cords or wires with a loop or eye in the centre, which are strung between two pieces of wood or a frame. A thread from the warp is drawn through each eye by means of a small hook, beginning with the first thread of the warp, through the first eye on the first shaft of the harness, the second thread through the first eye on the second shaft, the third through the first eye on the third shaft, and so on through the harness. When one thread has been drawn on each shaft, the next thread is drawn through the second eye on the first shaft and so through the harness again. This is called a straight draft; for special work other drafts are at times used. The number of shafts in the harness vary according to the character of the weave to be made, from two to thirty in number. In the case of harness for making brocades each eye is on an independent cord.

Next the warp threads are entered or drawn through the reed or comb—which is

* Contributed by Cheney Bros., South Manchester, Conn.

similar to an ordinary comb but closed top and bottom—one, two, three, or more threads in one dent or space between two teeth of the reed.

The warp with harness and reed is placed in proper position in the loom, the warp beam at the back next the harness, then the reed placed on the lathe or batten, and then the cloth, which is rolled up on another beam. When weaving is commenced, a certain number of the shafts of the harness are raised up; thereby lifting some of the threads of the warp above the others. Next the shuttle is thrown through the space between them. The shuttle contains a bobbin or quill of thread which is unwound as it passes through, supplying the cross threads or filling for the cloth. Then the reed is brought forward, pushing the filling into its proper place. The process is repeated, different shafts of harness being lifted at such time as to produce the desired weave. For instance, if a plain weave is desired, every other shaft is lifted, which in turn lifts every other thread; the next time the remaining shafts are lifted, while those lifted on the first pick stay down, and so on. An almost endless variety of weaves may be produced in this way, by the use of shafts, and almost all plain fabrics, such as Satins, Twills, Pongees, Taffetas, Armures, Crepes, Peau de Soies and Foulards, also a great variety of stripes and small figures are so woven. At the present time practically all figured or brocaded goods are woven by the use of the Jacquard machine, invented by Joseph Marie Jacquard, of Lyons, France, about the year 1800. In this machine each thread of the warp passes through an eye which is attached to a cord, in its turn attached to a hook. These hooks are controlled by paper cards with holes punched in them which either push the hooks back, or if holes are punched, allow them to be lifted by means of blades which rise and fall between the hooks. By the use of such machines very large patterns with great variety of weaves may be produced.

Ribbons are woven several pieces in one loom, with a separate shuttle for each piece, which is carried through the shed or warp by a rack and pinion, instead of being thrown through as in broad goods; otherwise the weaving is the same.

Velvets and other pile fabrics are woven in two pieces, one over the other with the pile threads woven back and forth between them. A knife travels between the two pieces cutting the pile threads so as to leave the ends standing up straight. Velvets used to be woven over wires and cut by hand, but this method is practically obsolete.

If the goods are woven with the gum still in the silk, it must be taken out afterward and the goods either dyed in the piece or prepared for printing.

The most primitive method of printing is by the use of stencils. It is the method employed by the Japanese and Chinese. Next came block printing, which is still extensively employed in Europe. The pattern is raised in felt on wooden blocks, the color taken up from pads, one block for each color. The results are good, but the work is very slow. Most silk goods are today machine printed. The design is engraved or etched on copper cylinders, one cylinder for each color; the color, thickened with gum, is supplied by rolls running against the cylinders and the surplus is scraped off by a knife blade, leaving only that in the engraving, which is taken up by the cloth. After printing, the cloth is steamed, to set the colors, and then washed, in order to remove the gum used to thicken the colors for printing.

All silk goods, whether yarn dyed, piece dyed or printed, are given some kind of finish; sometimes it is no more than is necessary to smooth out the wrinkles. But there are a great many such processes by which goods may be treated. They are run through gas flames to singe off loose fibre, over steam cylinders to dry and straighten them, over a great variety of sizing machines to stiffen them with starch or glue, calendars or heavy rolls to smooth and iron them, steam presses of great power to press them out, breaking and rubbing machines to soften them, tentering machines to stretch them to uniform width. There are also moiréing, or watering, embossing and various other machines for special purposes.

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